TOWN *of* BEDFORD

CLIMATE ACTION PLAN

a **bedford** twenty by **2020** project

Town of Bedford

Bedford Town House
321 Bedford Road
Bedford Hills, NY 10507

DRAFT *for* PUBLIC REVIEW

September, 2009

Dear Bedford Resident,

I am proud to present to you a draft of the Bedford Climate Action Plan (CAP).

In November 2007, the Town Board took an bold stance and passed a resolution committing Bedford to a twenty percent reduction in community wide greenhouse gas emissions, below our 2004 baseline year, by 2020. The Bedford Twenty by 2020 goal was the beginning of a two year campaign designed to educate, engage and gain the commitment of an entire town.

The nine members of the Town appointed Bedford Energy Advisory Panel (BEAP) have spent the last two years conducting an inventory of our community s greenhouse gas emissions, talking to experts, researching other cities best practices and engaging the community through a series of town wide events. The result is this draft document.

Hundreds of Bedford residents and businesses have followed BEAP s Green Tips in the Bedford Record Review, resourced the Winter Energy Savings Toolkit to save money and energy in their homes, attended mini summits on topics ranging from green building to the ethics of climate change, and participated in April is Earth Month events. And, in January 2009, the Bedford Environmental Summit brought together 1000 participants, 124 local partners and 240 volunteers for a full day conference to discuss the most pressing environmental issues of the day and to consider concrete actions that address these problems on a local level.

This level of participation among Bedford s residents shows a desire for action and a willingness to participate in the ongoing discussion about the best way to reach our goal.

This is your Climate Action Plan and we need your help to edit, critique and comment on the draft which you can do via email at bedfordenergy@bedfordny.info. To get to our goal of Twenty by 2020, we will need a shared commitment from every single resident of Bedford.

Please review the Bedford Climate Action Plan at www.bedfordny.info. We are anxious for your comments and ideas. Let s work together to advance Bedford s climate change goals and make our community a healthier, better place to live.

Sincerely,

Supervisor, Town of Bedford

This is a DRAFT version of Bedford s Climate Action Plan for Review and Comment. Public comment of this draft is welcome and appreciated and your input will be thoughtfully considered for integration into the final document. The Climate Action Plan, in its final form, will be presented to the Bedford Town Board for approval in October, 2009.

The public comment period will be open until October 14, 2009.

Please comment:

1. Visit www.bedfordny.info where you can find the complete draft document online and email your comments to Bedfordenergy@bedfordny.info

2. Attend one of the public meetings hosted by the Bedford Energy Advisory Panel. Members of the panel will be on hand to answer questions and take your comments.

- Wednesday, September 30th, 7:30pm
  Bedford Hills Community House
  74 Main St.
  Bedford Hills, NY

- Monday, October 5th, 7:30pm
  Bedford Historical Hall
  608 Old Post Rd.
  Bedford, NY

- Tuesday, October 13th, 7:30pm
  Katonah Village Library
  26 Bedford Rd.
  Katonah, NY

Letter *from the* Supervisor

We are at a watershed moment in Bedford s history. After more than two years of inspired work by the Bedford Energy Advisory Panel our Energy Action Plan is ready to be unveiled and their successor organization, Sustainable Bedford Coalition is about to be born.

In April of 2007, the Town Board appointed an Energy Advisory Panel composed of nine individuals from a cross section of our three hamlets, all with a keen interest in the environment. These nine individuals deserve our heartfelt thanks for their countless hours of work and their commitment to our Town. The panel included; Mary Beth Kass; chair, Simon Skolnick, Mark Thielking, Janet Harckham, Dr. Stuart Weitzman, Neal Hundt, Shirley Bianco, Daniel Martin and Bill Abranowicz with early support from Lisa Schwartz.

The panel s charge was to measure our greenhouse gas emissions and to develop a plan for the Town of Bedford to reduce those emissions 20% by the year 2020.

One of the most effective tools in this process was for the town to join ICLEI, Local Governments for Sustainability, an international organization dedicated to helping local governments measure their greenhouse gas emissions, establish reduction targets, develop a plan to meet those targets, implement the measures in the town s plan and, subsequently, monitor progress.

The Bedford Plan focuses on four sectors; Energy, Transportation, Land + Water Use and Waste + Recycling. Within these sectors are many sub-categories that are incorporated into the broader topics. This is not a government plan or strictly for municipal use, but it encompasses our businesses, residences, schools and virtually every segment of our Town. We are all partners in this endeavor and we encourage your participation in helping us achieve our goal.

This effort will affect everything we do, from the cars we drive, to the houses we build, to the food we eat; but the rewards will be great. We will be saving money and we will be living healthier lives. By conserving energy we can achieve our ultimate goal of being a sustainable community. We cannot change the whole world but we can affect what happens in our Town and by doing so, insure a better future for ourselves and for generations to come.

Sincerely,

Lee V.A. Roberts
Supervisor, Town of Bedford

Executive Summary

I. Bedford s Commitment

In April, 2007, Supervisor Lee Roberts and the Bedford Town Board appointed the Bedford Energy Advisory Panel (BEAP), consisting of nine individuals representing a cross section of our community. The panel was asked to study the issues relating to climate change and carbon emissions and produce a Climate Action Plan for the Town of Bedford that would provide a blueprint for reducing community-wide greenhouse gas (GHG) emissions. BEAP's first step was to join ICLEI, Local Governments for Sustainability, a membership association of more than 500 national and 1,000 international local governments committed to mitigating climate change. ICLEI assists in calculating a town s GHG emissions, establishing targets to reduce those emissions, developing a Climate Action Plan to meeting defined targets, implementing the measures in the Climate Action Plan and monitoring progress.

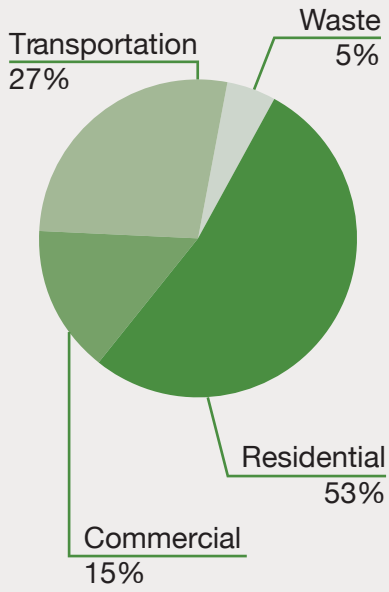
In November 2007, The Town Board took further action by passing a resolution, committing to a reduction of Bedford s GHG emissions by 20% by the year 2020. This is an aggressive goal that will have a meaningful impact on the global effort to mitigate climate change through local action, and will improve the quality of life in our own town.

The Bedford Energy Advisory Panel has spent the last two years collecting and examining data on energy consumption and waste generation across all sectors, speaking with experts, researching best practices and working with the town department heads to select the reduction measures with the most impact and greatest feasibility for Bedford.

II. Bedford s Greenhouse Gas Emissions Inventory (Pages 18-21)

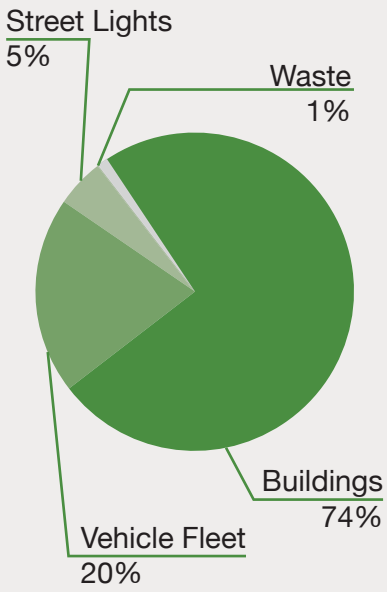
The first step toward reducing greenhouse gas emissions is to identify baseline levels of emissions in The Town of Bedford, as well as the sources and sectors of our community and government operations most responsible for those emissions. This information was key in selecting our reduction target as well as the reduction measures contained in this plan.

Community



Sector	GHG emissions (tonnes CO_2e)	Energy equivalent (MMBtu)
Residential	146,451	1,806,823
Commercial	40,116	400,452
Transport	74,693	959,118
Waste	14,691	
Total	**275,951**	**3,166,393**

Municipal



Sector	GHG emissions (tonnes CO_2e)	Energy equivalent (MMBtu)
Buildings	4,000	64,611
Vehicle Fleet	1,056	13,466
Streetlights	251	2,118
Waste	53	
Total	**5,360**	**80,194**

Community Emissions Inventory

In our chosen base year 2004, the community of The Town of Bedford emitted approximately 275,951 tonnes of CO2 equivalent (CO2e). Residential use was the greatest contributor to GHG emissions at 53% of the total. The Commercial sector contributed 15%, Transportation contributed 27%, and Waste contributed 5% of the community's total greenhouse gas output.

Municipal Emissions Inventory

In the base year 2004, The Town of Bedford s government operations generated 5,360 tonnes of CO2e. The Town's buildings were the greatest contributors, emitting 74% of the total. The vehicle fleet contributed 20%, streetlights contributed 5%, and waste contributed 1% of the government emissions

III. Bedford s Target Twenty by 2020

The Town of Bedford has made a commitment to reduce community-wide greenhouse gas emissions by 20% below 2004 levels by 2020. This means the community needs to reduce and prevent annual GHG emissions of 55,190 tonnes of carbon dioxide based on 2004 emissions data. If a standard growth rate of 2% were to be factored in, by 2020 the 20% target will have grown to 158,062 tonnes of needed emission reductions.

While this goal of 20% will prove to be challenging, many scientists believe that far greater reductions, closer to 80% worldwide, will be necessary to stabilize the concentration of greenhouse gases in the atmosphere. This will require a global commitment and response that does not currently exist. However, local municipalities all over the world are demonstrating strategies that effectively reduce emissions, increase economic vitality and livability. Bedford s plan proposes that we begin now, by setting a practical target with a large impact and by undertaking local actions that are feasible, and that provide multiple benefits for our community.

IV. Reduction Measures (Pages 22-85)

The emissions reduction measures contained in this Climate Action Plan will serve as a blueprint for reducing Bedford s greenhouse gas emissions. The Plan includes a wide range of local actions that vary in impact, scale,

difficulty and timeframe. This list is intended to inspire the community to change its behavior in myriad ways in order to reach our goal of Twenty by 2020. The recommended measures might be adopted in whole or in part or, some, not at all. Achieving the emissions reduction target will require a community-wide process that involves all sectors of the community residents, businesses, institutions and government.

The recommended actions contained in the plan have been grouped into four sectors: Energy, Transportation, Waste/Recycling and Land Use. Each sector is subdivided into municipal and community to illustrate how government and nongovernmental groups can take significant actions to achieve our goal.

These measures are intended to be recommendations. The many options listed in each category will be prioritized, refined and implemented in the months and years ahead. Some of these actions are already in progress, some will require further study, and some may not be feasible at this time.

Below is a summary of the recommended strategies for each sector included in the plan. See the corresponding pages for detailed recommendations: 22-85

Energy (pages 25-49)

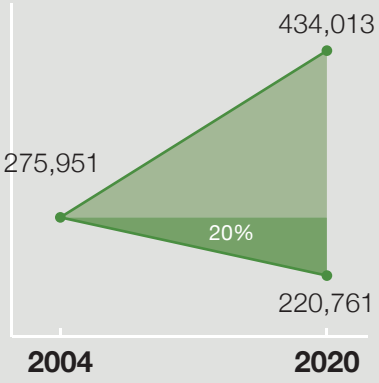
The measures contained in this section have the greatest potential to achieve our goal of Twenty by 2020. Implementation of these measures will encourage us to examine how our homes and offices impact the environment, how we can live more economically and more sustainably by adopting the energy saving technologies available to us.

Reducing GHG emissions from building energy use in Bedford will require action in two areas:

- Improve energy efficiency -- Achieving higher energy efficiency means being smarter about how we design and construct new buildings and also how we retrofit our existing housing and commercial stock.
- Increase the number of renewable sources of electricity (such as solar, wind, hydroelectric and geothermal.) -- The support, research and development of clean, renewable sources of energy are also essential if we are to maintain our rate of growth and continued demand for energy. Unlike our existing fossil fuel infrastructure, renewables take advantage of infinite, natural and free resources and do not contribute to GHG emissions or air pollution.

Business as Usual

Assuming an annual 2% growth rate, Bedford needs to reduce the predicted Business as Usual 2020 emissions by an additional 102,872 tonnes of CO_2e in order to reach the desired 20% reduction below 2004 levels



Transportation (pages 51-66)

The measures contained in this section may be the most challenging to implement, as shifting demand away from the personal vehicle and toward alternative modes of transportation is dependent upon personal choice.
In Bedford, transportation accounts for 27% of our greenhouse gas emissions, in addition to contributing countless other pollutants to the atmosphere.

There are three principal ways to reduce the emissions from transportation vehicles in Bedford:

- Reduce the total number of miles traveled by switching transportation to walking, bicycling, and mass transit.
- Shift to more fuel-efficient cars by trading in larger, less efficient vehicles for smaller vehicles, or purchasing hybrid electric vehicles.
- Switch to fuels that emit fewer pollutants, such as biodiesel and compressed natural gas (CNG).

Waste + Recycling (pages 67-74)

The Waste Sector contributes 5% of The Town of Bedford's annual greenhouse gas emissions. However, it is important to note that in gathering data for Bedford, we considered only waste that was generated within our town borders. Direct emissions are not reflected in our town's data because Bedford does not have a landfill. However, the consumption habits and disposal methods of the residents of Bedford are contributing to greenhouse gas emissions that would be counted in the inventory of the city in which the landfill is located.

While we may not measure a high percentage of emissions from the Waste Sector in our town, we have a responsibility to examine our existing waste generation and disposal in order to reduce emissions wherever they are measured.

The actions outlined in this section focus on the following actions in our homes and businesses:

- Conducting a waste audit to determine the source and make up of Bedford s waste.
- Reducing waste by encouraging less consumption, the purchasing of items with less packaging, and the reuse of items.

- Increasing recycling, composting and related services among Bedford residents and businesses and expanding the types of materials that can be recycled and composted.

Land + Water Use (Pages 75-84)

Land use planning includes strategies for preserving the natural environment, conserving water, and minimizing the use of automobiles so that we can reduce greenhouse gas emissions and better enjoy the beauty and luxury of our natural resources.

The measures contained within this sector of the Climate Action Plan support, enhance and complement the goals and recommendations in the Bedford Comprehensive Plan and focus on:

- Water conservation measures such as low flow fixtures and modifying water use behaviors
- Transitoriented development that directs growth to areas within walking and biking distance of mass transit
- Landscape alternatives, including the use of native plants and drought resistant grasses, planting trees to shade buildings and reduce runoff, organic landscape maintenance and the use of rain water collection systems such as rain barrels.

V. Implementation (Pages 18-21)

The approval of the Bedford Climate Action Plan will be the final step in transitioning from the government appointed Bedford Energy Advisory Panel to a community-wide partnership and new entity to be known as the Sustainable Bedford Coalition (SBC). This community wide stakeholders group will be organized into 10 task force areas, each charged with implementing the measures set forth in our Climate Action Plan. Implementation will be carried out on the municipal level by the local government and on the community level under the leadership of the Sustainable Bedford Coalition.

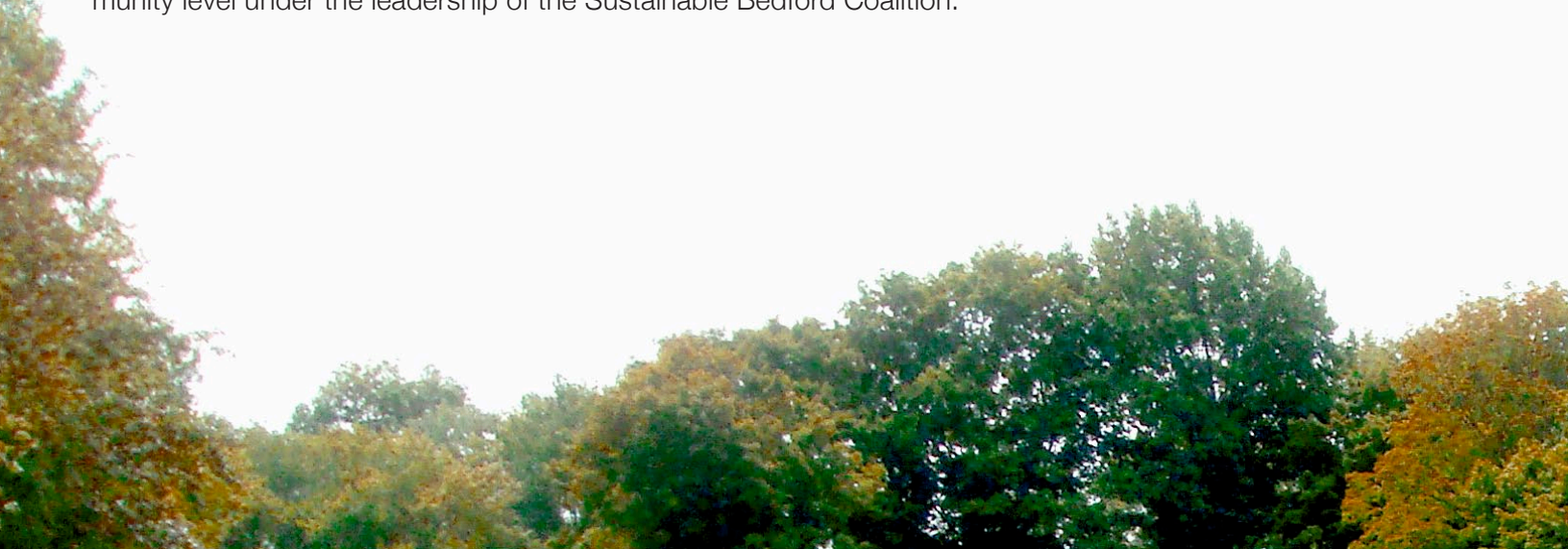
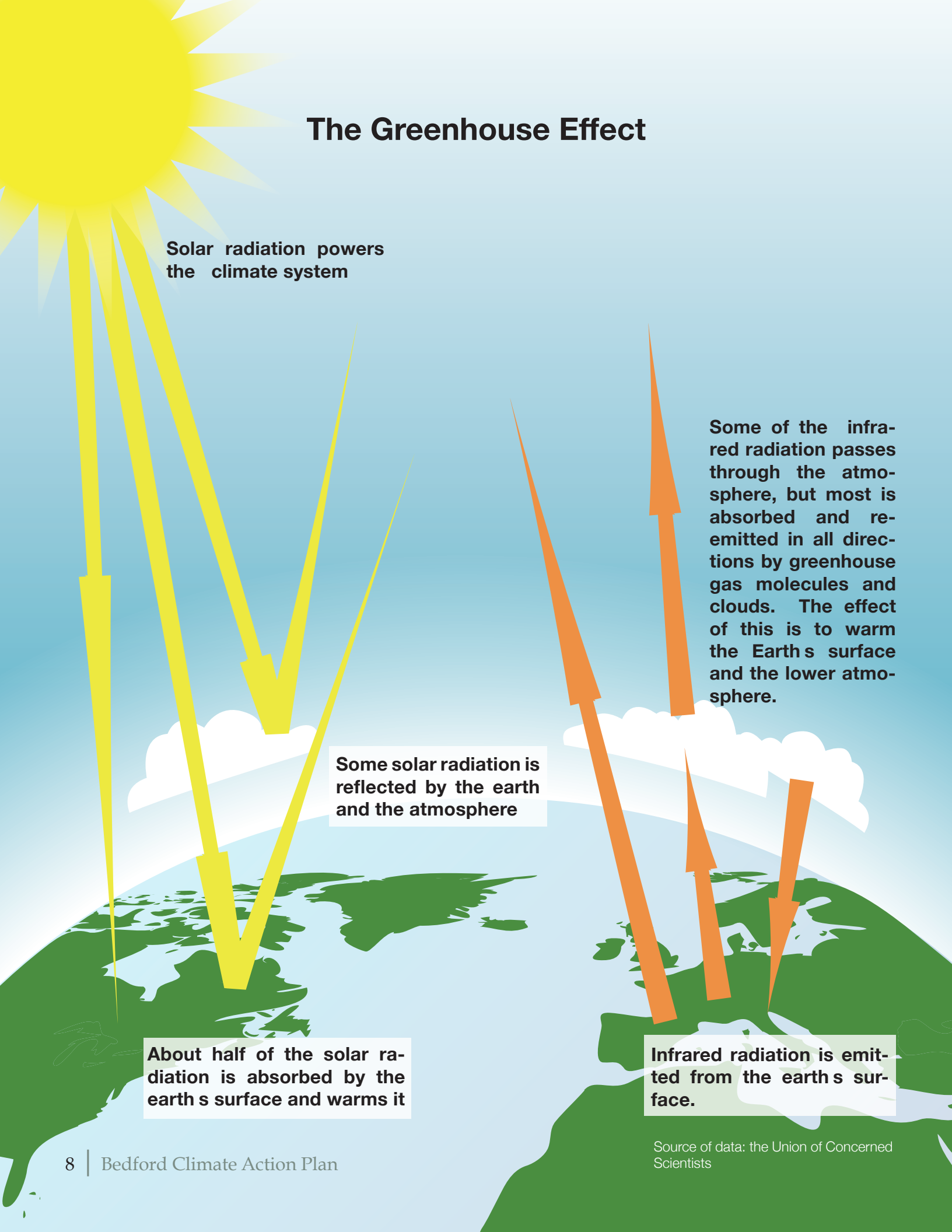


Table of Contents

The Greenhouse Effect



Source of data: the Union of Concerned Scientists

I. Introduction

Climate change is fast becoming the most pressing issue facing the global community. The warning signs like intensified weather patterns, Arctic sea ice melt and sea level rise are only the beginning, and foreshadow far worse and more localized changes over the next century. The scientific consensus places human actions as the most likely cause of our climate s destabilization, which leaves us with the task of reversing these changes and repairing our planet s health.

a. Climate Science

The Earth s atmosphere is naturally composed of a number of gases that blanket the surface and act like the glass panes of a greenhouse. These greenhouse gases (GHGs) absorb outgoing heat and re-radiate energy back down to the surface, warming the earth and making it stable and hospitable for life at an average temperature of 60 F. Without the natural warming effect of these gases the average surface temperature of the Earth would be around 14 F.

However, recently elevated concentrations of these gases in the atmosphere have had a de-stabilizing effect on the global climate, fueling the phenomenon commonly referred to as climate change. Carbon dioxide (CO2) is the most important anthropogenic GHG. Our adoption of a highly industrialized economy has resulted in a need for fossil fuel industries that continuously pump additional CO_2 into the atmosphere. Due to our current reliance on the burning of fossil fuels like oil and coal, annual CO_2 emissions have grown between 1970 and 2004 by about 80%, and represent 77% of total anthropogenic GHG emissions in 2004. This drastic GHG increase since the mid 1970s has resulted in a noticeable warming, raising the average surface tempertature by about 1 F in the last 40 years. The eight warmest years on record have all occurred since 2001, with the warmest year being 2005. Additionally, it is predicted that the climate will continue to warm at a rate of about 0.29 F/decade or more if we don t act now.

Because the climate and the atmosphere do not react in a linear fashion to increased greenhouse gases, it is impossible to predict what impact a ton of carbon dioxide will actually have on the global climate. The Earth s climate has a number of feedback loops and tipping points that scientists fear will increase the unwanted effects of greenhouse gases and climate destabilization beyond the rate at which it is currently occurring. For example, polar ice caps are composed of highly reflective expanses of ice that act

Greenhouse Gases

Carbon Dioxide (CO_2)
Emitted in residential, commercial, industrial and transportation sectors during the burning of fossil fuels like oil, natural gas, coal and wood. CO_2 accounts for 85% of U.S. Greenhouse Gas Emissions.

Methane (CH_4)
Emitted primarily during organic decomposition in land fills, agriculture and the raising of livestock. Methane accounts for 8% of U.S. GHG emissions and is about 25 times as potent as CO_2.

Nitrous Oxide (N_2O)
Emitted during agriculture and industrial activies. Accounts for 5% of U.S. GHG emissions.

Other man-made GHGs include **hydrofluorocarbons** (HFCs), **perfluorocarbons** (PFCs), and **sulfur hexafluoride** (SF_6).

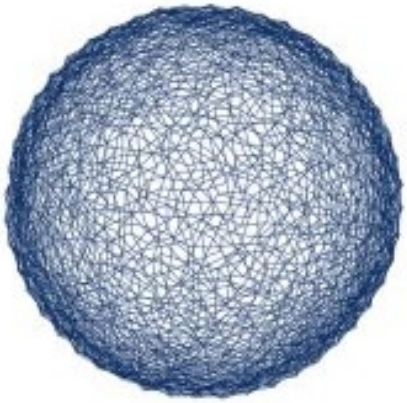
Source of data: Worcester CAP and the World Resources Institute

effectively like a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface will tend of absorb more heat, accelerating the speed at which the planet warms with each ton of greenhouse gas emitted, and in turn melting more arctic ice reinforcing the positive feedback loop. Another example is the behavioral feedback loop associated with air conditioner use. As the climate warms, people, not accustomed to the temperature change, buy more air conditioners and run them for extended periods of time. This results in a need for more energy production (often from fossil fuel sources) which warms the climate and encourages the purchase of more air conditioners.

b. International & National Policy

Although efforts have been made on international and national scales to slow the changes, none have had any considerable lasting effect on climate legislation.

Between 1997 and 1999, the Kyoto Protocol was negotiated in Japan, hoping to inspire industrialized countries to reduce their GHG emissions by 5% below 1990 levels. Even though this ambitious agreement has involved most of the global community in GHG reductions, the United States has remained hesitant to pledge support and sign.



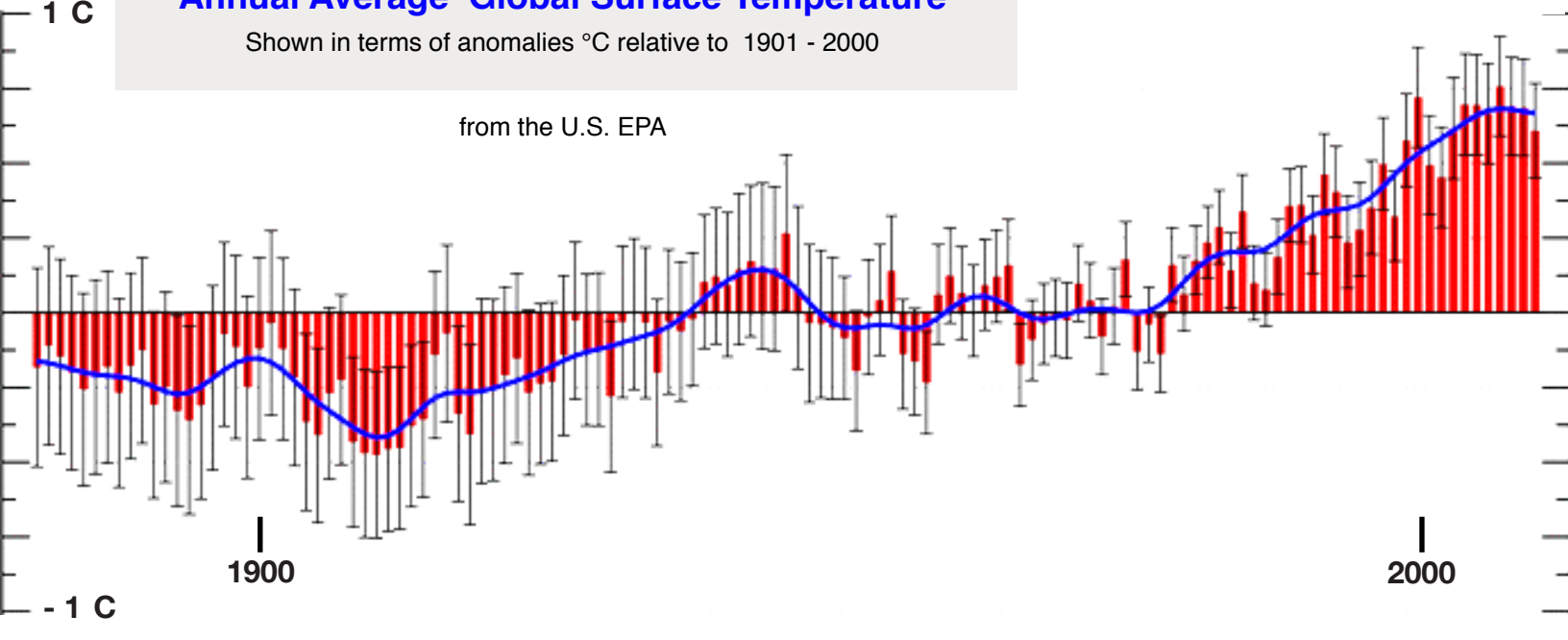
COP15
COPENHAGEN
UN CLIMATE CHANGE CONFERENCE 2009

Currently however, the US is working to pass climate legislation that would impose a cap on emissions and reduce them 80% by 2050 through a Cap and Trade program while preparing for another round of climate negotiations in Copenhagen for COP15. Although mindful that these efforts will come to fruition at some point, we, in Bedford, have decided to take action locally and as soon as possible. We have joined ICLEI Local Governments for Sustainability, agreed on a 20% GHG reduction by the year 2020 and are

Annual Average Global Surface Temperature

Shown in terms of anomalies °C relative to 1901 - 2000

from the U.S. EPA



Air Pollutants

Pollutant	Health Effects
Nitrogen Oxides (NOx) 	Decreases lung function. Associated with respiratory disease in children.
Sulfur Dioxide (SO2) 	Causes coughing, weezing, shortness of breath, nasal congestion & inflammation. Makes asthma worse & destabalizes heart rhythms. Can cause low birth weight & increased risk of infant death.
Carbon Monoxide (CO) 	Can cause cardiovascular problems, chest pain & vision problems. Reduces your ability to work or learn & complete complex tasks. High levels can cause serious respiratory problems or death
Volatile Organic Compounds (VOCs)	Can cause eye, nose and throat irritation, headaches, loss of coordination, nausea, damage to liver, and central nervous system. Some may also cause cancer.

Source of data: Worcester, MA CAP

now publishing this Climate Action Plan while waiting for broader legislation to pass.

c. Our Climate Action Plan (CAP)

By consciously acting to reduce GHG emissions on a local level, we have the opportunity to address the challenge of climate change directly, save resources and preserve the quality of our lives. By adopting a climate action plan, we can save money, create jobs, improve our health, promote energy security, and work towards addressing climate change without drastically changing our daily behavior.

Economic Benefits + Job Creation

A low carbon future will promote cost saving technologies and call for job creation across the nation. We will be encouraging the use of more efficient appliances, energy audits and building retrofits and other reduction measures that will all dramatically lower your utility bills. The development of a renewable energy infrastructure featuring solar and wind power will reinforce the resiliency of our local and national economy. The purchase of fuel efficient and alternative fueled cars and trucks will keep energy dollars in our country and region instead of exporting them to often hostile nations overseas.

This will create more jobs for Bedford and drive demand for locally produced products and services. If all of our 6400 households achieved 30% efficiency improvements thorough energy audits and retrofits, or more efficient appliances, the community would collective save over $10 million and create at least 50 new jobs.

Similarly, in transportation, if 500 vehicles earning 30mpg were swapped out for vehicles achieving 45 mpg, the burning of 109,000 gallons of imported gasoline would be avoided and $215,000 dollars would be saved.

Quality of Life + Health

In addition to countless economic benefits, climate protection can also improve community well being. By reducing greenhouse gas emissions and waste, we can make our environment a much healthier place to live in with cleaner air and water. Living spaces designed with natural light in mind also make for a less stressful and more productive lifestyle within. And outdoors, as we rethink our transportation and zoning patterns we can encourage a more active lifestyle through biking and walking.

Similarly, by eating locally produced, fresh food, we can lower greenhouse

gas emissions associated with food production and improve our daily diet. Modern day agribusiness promotes unsustainable farming practices for both people and the earth with excessive use of pesticides and emissions generated with food transport. Eating organic, local food means that you are reducing food miles and consuming a better, healthier product. As a rural town, Bedford has great potential to build local food infrastructure.

In Bedford, we are already aware of the decreasing quality of our air and the increased prevalence of diseases. Climate Change will bring about severe and longer heat waves in the area that can threaten the health of the most vulnerable. Heat waves have already led to power outages, resulting in heat stroke and stress among the aging. Further, the EPA has classified Westchester as an air quality nonattainment area (meaning, not in compliance with air quality standards under the Clean Air Act) due to persistent ground level smog (ozone) and particulates. Worsening air quality from the combination of vehicular emissions, increased heat, and increased electrical usage are predicted to contribute to increased cardiovascular and respiratory diseases. With warmer and longer summers, the pollen and mold season will be extended, leading to allergies and triggering increased asthma attacks. West Nile virus carried by mosquitoes and Lyme disease carried by ticks are expected to become more prevalent, with warmer temperatures and increased flooding.

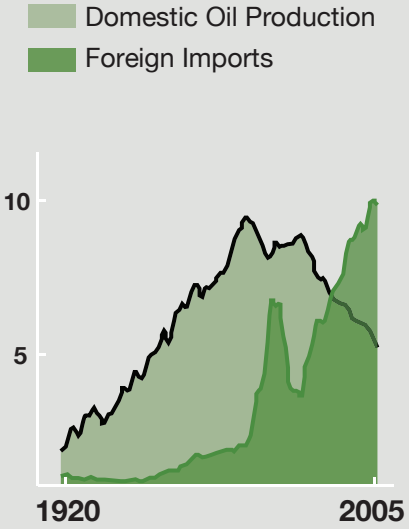
Energy Security

America s reliance on foreign oil and other fossil fuels threatens our environment, our economic prosperity and our national security. Americans represent less than 5% of the global population but consume nearly one quarter of the world s produced oil for transportation and heating. Additionally the U.S. holds less than 2% of the world s proven oil reserves but, in order to meet its needs, now imports 60% of its oil from foreign sources. The U.S. also holds around 2% of the world s natural gas reserves. At current consumption rates, we will have to begin importing large quantities to generate electricity.

Domestic oil production hit its peak in 1970 and since then has been declining. The U.S., not being an oil rich area, cannot indefinitely exploit its dwindling oil reserves. Instead, the U.S. will import more and more fossil fuels from foreign nations. Foreign oil imports accounted for a third of America s record trade deficit in 2006 and are responsible for half of the increasing imbalance since 2002. Importing oil and natural gas in such vast quantities creates a trade imbalance that weakens the U.S. dollar in the global economy. This consequently drives up the cost of imported goods, and passes them along to American families. Additionally, this dependence makes the United States more dependent on, and vulnerable to, the decisions of other governments.

United States Oil
Production + Imports

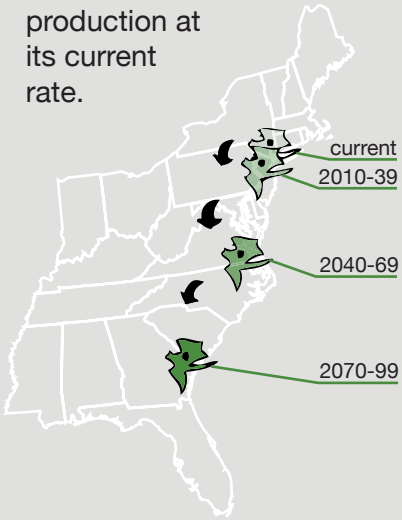
in millions of barrels/day



generated from EIA data

Westchester s Climate

Westchester s climate will resemble that of southern Georgia by the end of the century if we continue GHG production at its current rate.



NY Tri-State Area

Westchester County

Source of data: Westchester County Action Plan

This situation leads to a heavy national security risk. Oil money is increasingly being used to fund governments and projects that are opposed to U.S. interests. Profits from oil often accumulate in the hands of totalitarian foreign governments that not only repress their own people, but in many cases, also fund terrorist cells and training camps that amplify anti-American sentiment. This gives oil producing nations a great amount of power in global affairs. As oil supplies dwindle and consuming countries get increasingly desperate, competition for limited resources will intensify and oil producing nations will become ever-more powerful.

Bedford relies on fuel oil, natural gas and electricity for energy used in homes and businesses. The vast majority of this energy is imported. Electricity comes from generating facilities throughout the Northeast and eastern Canada and is delivered over a network of transmission grids. Natural gas is delivered from an even wider area through pipelines. Independent dealers deliver fuel oil, which is derived mostly from overseas. Reduction of imported energy will not only address the national issues described above, but will also free more local dollars for other priorities. Bedford now has the opportunity to use cleaner, cheaper and more efficient methods to power our businesses, our homes, and our lives and to mitigate the national problem of imported fossil based energy sources.

Climate

The development of environmentally friendly practices by our town, and eventually on a national scale, is the only way to ensure that our climate stays well-suited to human comfort. Never in the past 1000 years has the planet warmed at a faster rate than during the 20th century, and the most recent decade has been the warmest on record. If this trend to continues it could result in decreased agricultural output, increased catastrophic weather events such as forest fires, drought and floods and displacement of entire populations due to rising sea levels.

In the Northeast, we are beginning to see the devastating changes of excessive greenhouse gas accumulation in the atmosphere and a changing climate. It has been predicted that winters could warm by 8 to 12 F and that summers could warm by 6 to 12 F by late this century. This means that our snow filled winters may soon be a thing of the past. In fact, models indicate that without change, only western Maine may be able to support skiing by the end of the century.

In Westchester, the changing climate also means an increase in severity and frequency of storms, including rainfall events, hurricanes, tropical storms, nor easters, tornados, and other high wind hazards. In fact, If these trends in GHG emissions continue unchecked, the NECIA report projects that the climate in Westchester will resemble the climate of southern Georgia by the

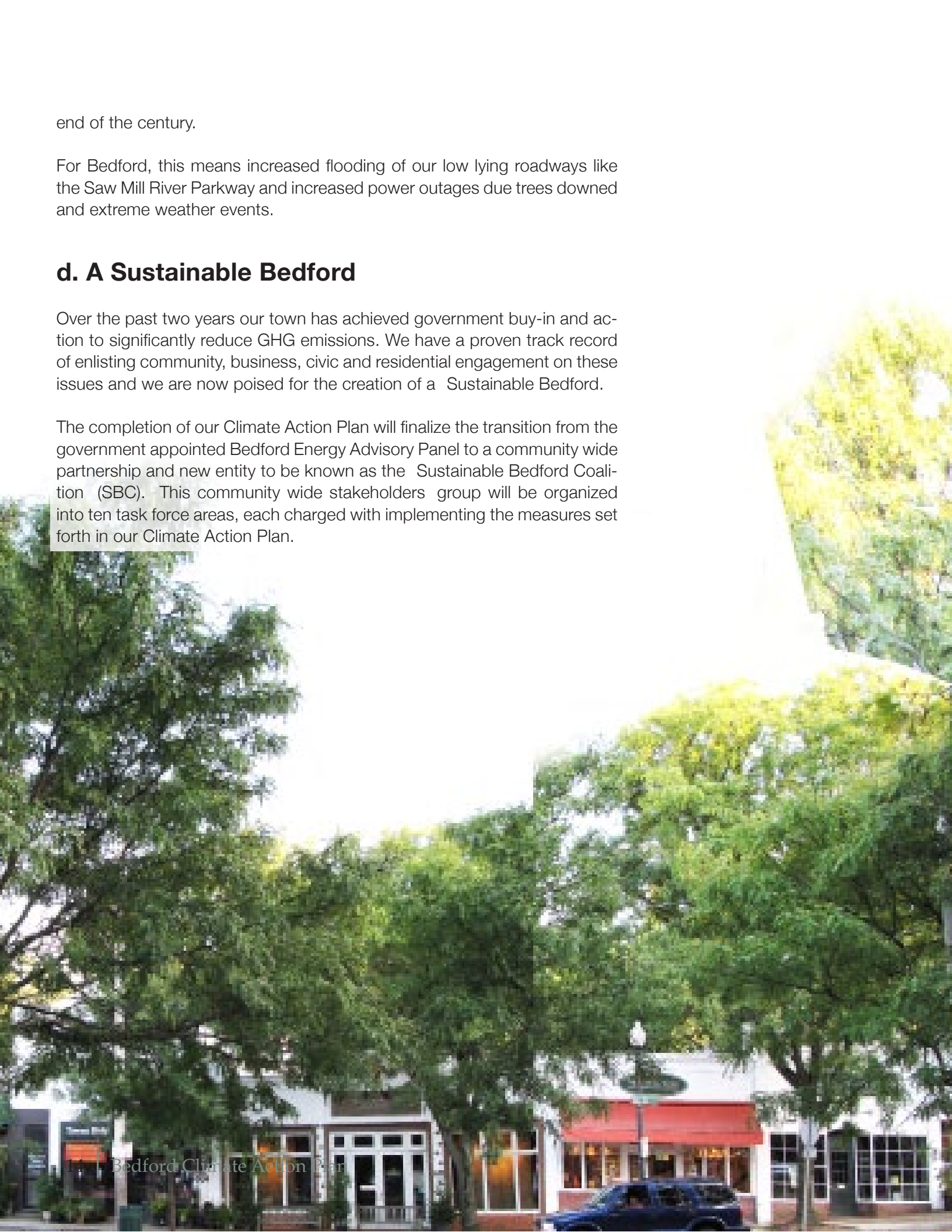
end of the century.

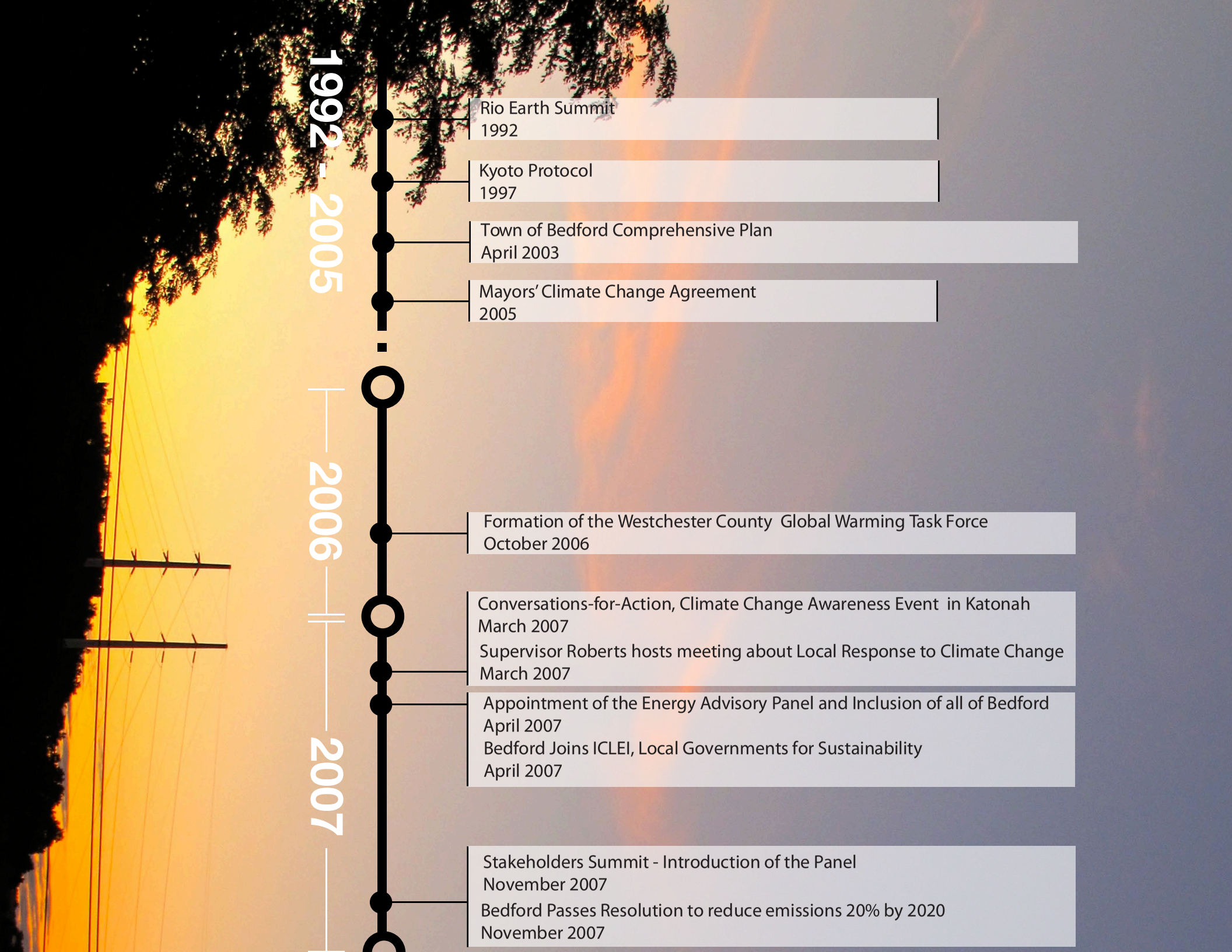
For Bedford, this means increased flooding of our low lying roadways like the Saw Mill River Parkway and increased power outages due trees downed and extreme weather events.

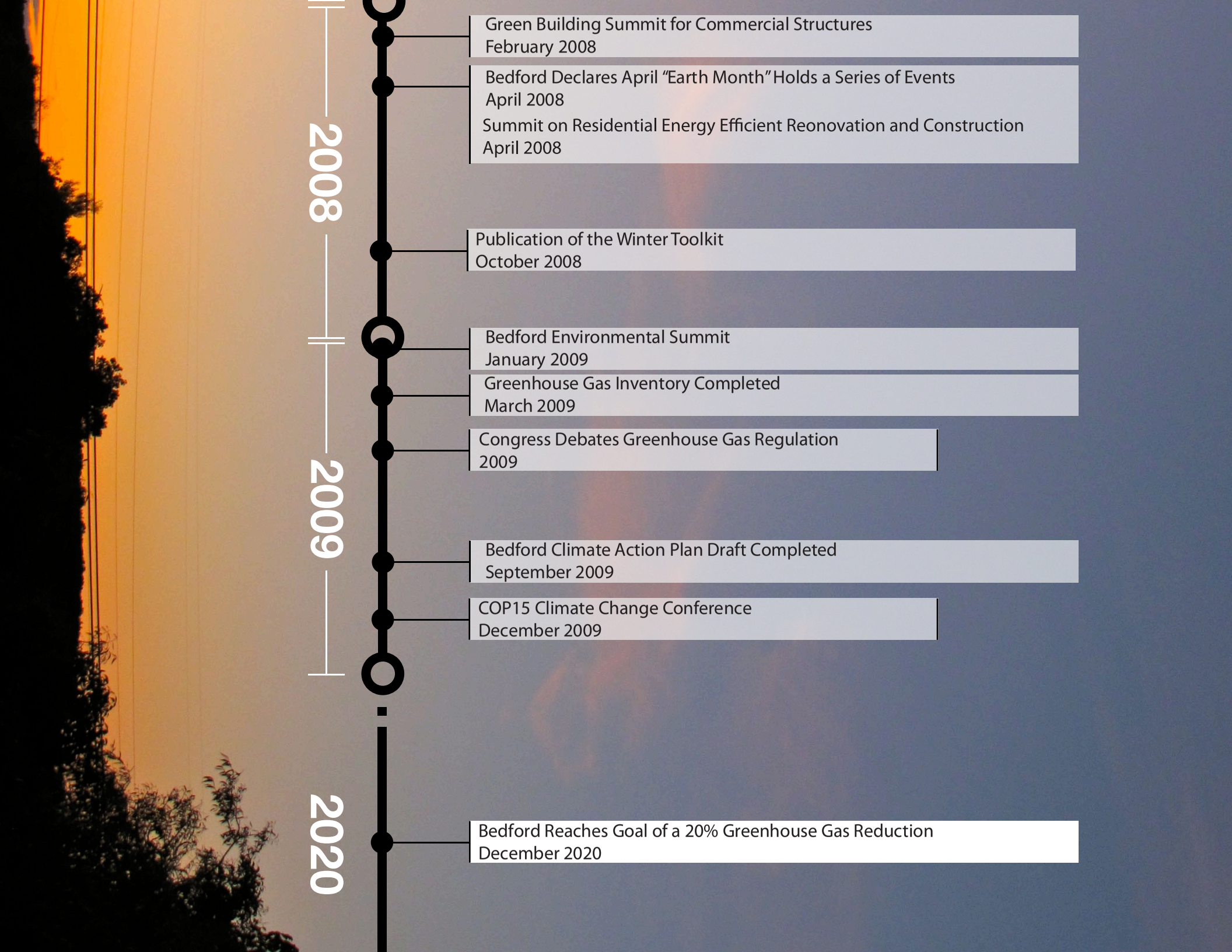
d. A Sustainable Bedford

Over the past two years our town has achieved government buy-in and action to significantly reduce GHG emissions. We have a proven track record of enlisting community, business, civic and residential engagement on these issues and we are now poised for the creation of a Sustainable Bedford.

The completion of our Climate Action Plan will finalize the transition from the government appointed Bedford Energy Advisory Panel to a community wide partnership and new entity to be known as the Sustainable Bedford Coalition (SBC). This community wide stakeholders group will be organized into ten task force areas, each charged with implementing the measures set forth in our Climate Action Plan.




1992 - 2005
2006
2007
Rio Earth Summit
1992
Kyoto Protocol
1997
Town of Bedford Comprehensive Plan
April 2003
Mayors' Climate Change Agreement
2005
Formation of the Westchester County Global Warming Task Force
October 2006
Conversations-for-Action, Climate Change Awareness Event in Katonah
March 2007
Supervisor Roberts hosts meeting about Local Response to Climate Change
March 2007
Appointment of the Energy Advisory Panel and Inclusion of all of Bedford
April 2007
Bedford Joins ICLEI, Local Governments for Sustainability
April 2007
Stakeholders Summit - Introduction of the Panel
November 2007
Bedford Passes Resolution to reduce emissions 20% by 2020
November 2007


2008
Green Building Summit for Commercial Structures
February 2008
Bedford Declares April "Earth Month" Holds a Series of Events
April 2008
Summit on Residential Energy Efficient Reonovation and Construction
April 2008
Publication of the Winter Toolkit
October 2008
2009
Bedford Environmental Summit
January 2009
Greenhouse Gas Inventory Completed
March 2009
Congress Debates Greenhouse Gas Regulation
2009
Bedford Climate Action Plan Draft Completed
September 2009
COP15 Climate Change Conference
December 2009
2020
Bedford Reaches Goal of a 20% Greenhouse Gas Reduction
December 2020

II. Greenhouse Gas Emissions Inventory

a. Introduction

In April 2007, the Town of Bedford joined ICLEI, Local Governments for Sustainability and the Town Board adopted a resolution committing the Town to taking action for climate protection. Through this resolution, the Town recognized the profound effect that greenhouse gases emitted by human activity are having on the Earth s climate, as well as the Town s opportunity to reduce these emissions, both through its government operations and by inspiring change throughout the community. With the assistance of ICLEI, the Town began its efforts to identify and reduce greenhouse gas emissions.

Presented here are estimates of greenhouse gas emissions resulting from our community as a whole, as well as those resulting from the Town s internal government operations. Due to availability, community and government operations data is based on the year 2004. This data will provide a baseline against which we will be able to compare future performance, enabling us to demonstrate progress in reducing emissions.

By adopting a resolution committing the Town to locally advancing climate protection, The Town of Bedford has joined an international movement of local governments. More than 1000 local governments, including over 500 in the United States, have joined ICLEI s Cities for Climate Protection (CCP) campaign

The CCP campaign provides a framework for local communities to identify and reduce greenhouse gas emissions, organized along five milestones:

(1) Conduct an inventory of local greenhouse gas emissions;
(2) Establish a greenhouse gas emissions reduction target;
(3) Develop an action plan for achieving the emissions reduction target;
(4) Implement the action plan; and,
(5) Monitor and report on progress.

b. Methodology & Model

The first step toward reducing greenhouse gas emissions is to identify baseline levels of emissions in the Town of Bedford, as well as the sources and sectors of our community and government operations most responsible for those emissions. This information was key in selecting our reduction target as well as the reduction measures contained in this plan.

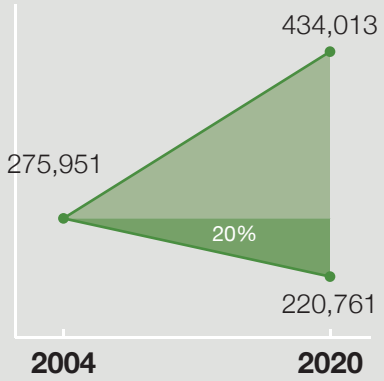
ICLEI s Communities for Climate Protection methodology assists local governments in systematically tracking community energy and waste related activities, and in calculating the relative quantities of greenhouse gases produced by each activity and sector. The inventory methodology involves performing two assessments: a communitywide assessment and a separate inventory of government facilities and activities. The government inventory is a subset of the community inventory.

To facilitate community efforts to reduce greenhouse gas emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package with the State and Territorial Air Pollution Program Administrators (STAPPA), the Association of Local Air Pollution Control Officials (ALAPCO), and Torrie Smith Associates. This software calculates emissions resulting from energy consumption and waste generation. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Greenhouse gas emissions are aggregated and reported in terms of equivalent carbon dioxide units, or CO2e. Converting all emissions to equivalent carbon dioxide units allows for the consideration of different greenhouse gases in comparable terms.

The emissions coefficients and methodology employed by the CACP software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form1605).

Business as Usual

Assuming an annual 2% growth rate, Bedford needs to reduce the predicted Business as Usual 2020 emissions by an additional 102,872 tonnes of CO2e in order to reach the desired 20% reduction below 2004 levels



c. Creating the Inventory

Our greenhouse gas emissions inventory consists of two essentially distinct inventories: one for the Town of Bedford community as a whole, defined by our geographic borders, and one highlighting emissions resulting from the

Town of Bedford s internal government operations. The government inventory is a subset of the community-scale inventory (the two are not mutually exclusive). This allows the government, which formally committed to reducing emissions, to track its individual facilities and vehicles and to evaluate the effectiveness of its emissions reduction efforts at a more detailed level. At the same time, the community-scale analysis provides a performance baseline against which we can demonstrate progress being made throughout the Town of Bedford community.

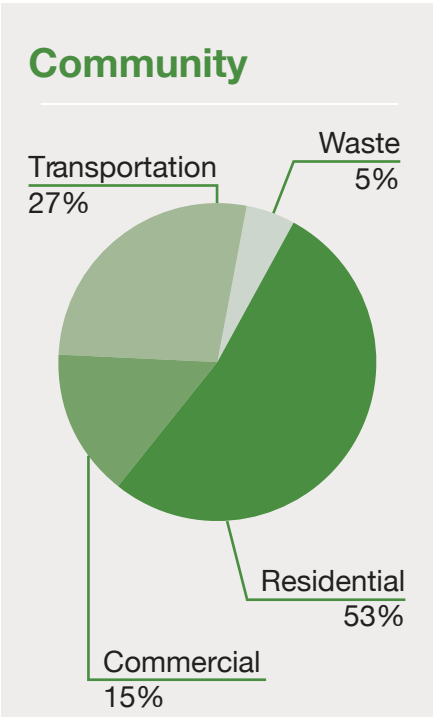
Creating our emissions inventory required the collection of information from a variety of sources (See Appendix for complete inventory source data.) Data from the year 2004 was used for both the community inventory and the government inventory.

When calculating the Town of Bedford s emissions inventory, all energy consumed in the Town of Bedford was included. This means that, even though the electricity used by Town of Bedford residents is produced elsewhere, this energy and the emissions associated with it appears in the Town of Bedford s inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full responsibility for the impacts associated with its energy consumption, regardless of whether or not the energy generation occurs within its geographic borders.

d. Community Emissions Inventory

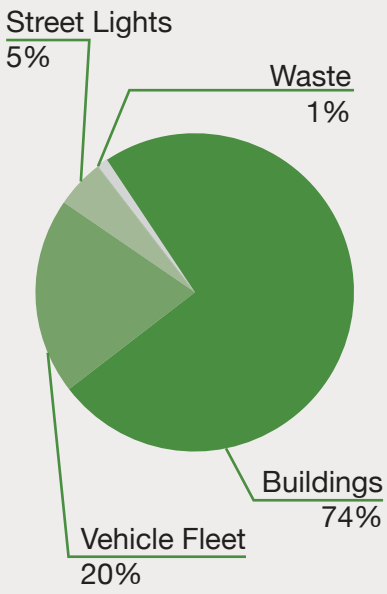
In the base year 2004, the community of The Town of Bedford emitted approximately 275,951 tonnes of CO2e. As shown in the pie chart above, Residential use was the greatest contributor to greenhouse gas emissions at 53% of the total. The Commercial sector contributed 15%, Transportation contributed 27%, and Waste contributed 5% of the community's total greenhouse gas output.

The Town of Bedford community s consumption of electricity and other fuels in local buildings and vehicles is also responsible for the release of criteria air pollutants, including NOX, SOX, CO, VOCs, and PM10. The Transportation sector is responsible for the majority of NOX, CO and VOC emissions, while energy used in buildings is primarily responsible for emissions of SOX and PM10.



Sector	GHG emissions (tonnes CO2e)	Energy equivalent (MMBtu)
Residential	146,451	1,806,823
Commercial	40,116	400,452
Transport	74,693	959,118
Waste	14,691	
Total	**275,951**	**3,166,393**

Municipal



Sector	GHG emissions (tonnes CO_2e)	Energy equivalent (MMBtu)
Buildings	4,000	64,611
Vehicle Fleet	1,056	13,466
Streetlights	251	2,118
Waste	53	
Total	**5,360**	**80,194**

e. Municipal Emissions Inventory

In the base year 2004, the Town of Bedford s government operations generated 5,360 tonnes of CO2e. The Town's buildings were the greatest contributors, emitting 74% of the total. The vehicle fleet contributed 20%, streetlights contributed 5%, and waste contributed 1% of the government emissions.

Government operations emissions in The Town of Bedford constitute about 2 percent of the community s total greenhouse gas emissions. This is not unusual; local government emissions typically account for around two percent of community levels. As a minor contributor to total emissions, actions to reduce government operations energy use will have a limited impact on The Town of Bedford community s overall emissions levels. However, as previously mentioned, government action has symbolic value that extends beyond the magnitude of emissions actually reduced.

f. Conclusion

In passing a resolution to join the Communities for Climate Protection campaign, The Town of Bedford made a formal commitment to reduce its emissions of greenhouse gases. This inventory lays the groundwork for those efforts by estimating baseline emissions levels against which future progress can be demonstrated.

The Bedford Climate Action Plan proposes that we reduce GHG emissions by 20 percent below 2004 levels by 2020. This means the community needs to reduce and prevent annual GHG emissions of 55,190 tonnes of carbon dioxide based on 2004 emssions. If a standard growth rate of 2% were to be factored in, by 2020 the 20% target will have grown to 158,062 tonnes of needed emission reductions. However, many scientists believe that far greater reductions, closer to 80 percent worldwide, will be necessary to stabilize the concentration of greenhouse gases in the atmosphere. This will require a global commitment and response that does not currently exist. However, local municipalities all over the world are demonstrating strategies that effectively reduce emissions, increase economic vitality and livability. Bedford s plan proposes that we begin now, by undertaking local actions that are feasible, impactful and that provide multiple benefits for our community.

III. Reduction Measures

a. Summary

The emissions reduction measures contained in this section will serve as a blueprint for reducing Bedford s greenhouse gas emissions. There is no simple path nor any one measure that will get us to our lofty goal of a twenty percent GHG reduction by the year 2020. This is why we have included a myriad of actions, varying in scale, difficulty and timeframe to be used, in part or in whole, to meet our goal. Achieving the emissions reduction target will require a community-wide process, involving residents, businesses, institutions and government.

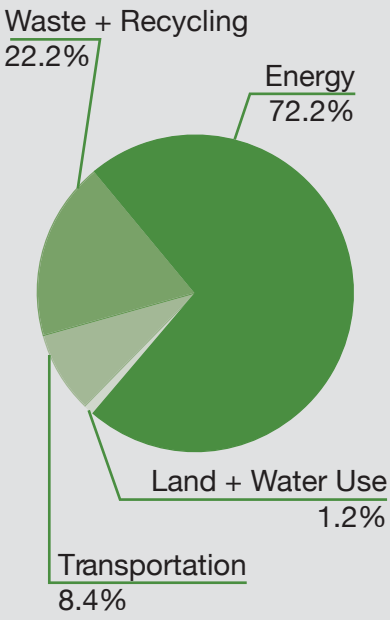
The recommended actions described in this section have been grouped into four sectors: Energy, Transportation, Waste + Recycling and Land + Water Use. Each sector is also split into municipal (grey pages) and community (white pages), so that the Bedford government will be able to easily locate and implement the most effective measures and act as a role model for the second half of the plan and the residents. Where possible, each measure has been examined to determine: ghg reduction potential, cost and ease of implementation, payback period, and any additional benefits. We have also included all information pertaining to other pollutants that will be prevented.

The Bedford Energy Advisory Panel has spent the better half of two years, speaking with experts, researching best practices and working with the town department heads to select the measures that are the most impactful and the most feasible for Bedford. We urge you to use this plan, knowing that it has been customized for the needs of our community.

These measures are intended to be potential measures. This menu option of recommendations will be prioritized and implemented in the months and years ahead. Some of these actions are already in progress, some will require further study, and some may not be possible at this time. We all have a role to play in turning this plan into action. It will require the political will of our local leaders, as well as the will of the entire community.

The information contained in the Emissions Reduction Measures Section of the Bedford Climate Action Plan was obtained using ICLEI s Climate and Air Pollution Planning Assistant (CAPPA) software. CAPPA provides information and quantification tools for over 100 distinct emissions reduction strategies. The quantification calculator proved invaluable in selecting reduction

Reduction Measures



Sector	GHG emissions (tonnes CO_2e)	Number of Measures
Energy	135,468	24
Waste + Recycling	34,094	16
Transport.	15,674	22
Land + Water Use	2,307	9
Total	**187,543**	**71**

CAP Co-Benefits

Throughout the Bedford Climate Action Plan, the term Co-Benefits refers to positive impacts our proposed measures will have on our lifes.

Economic Benefits & Job Creation

Quality of Life & Health

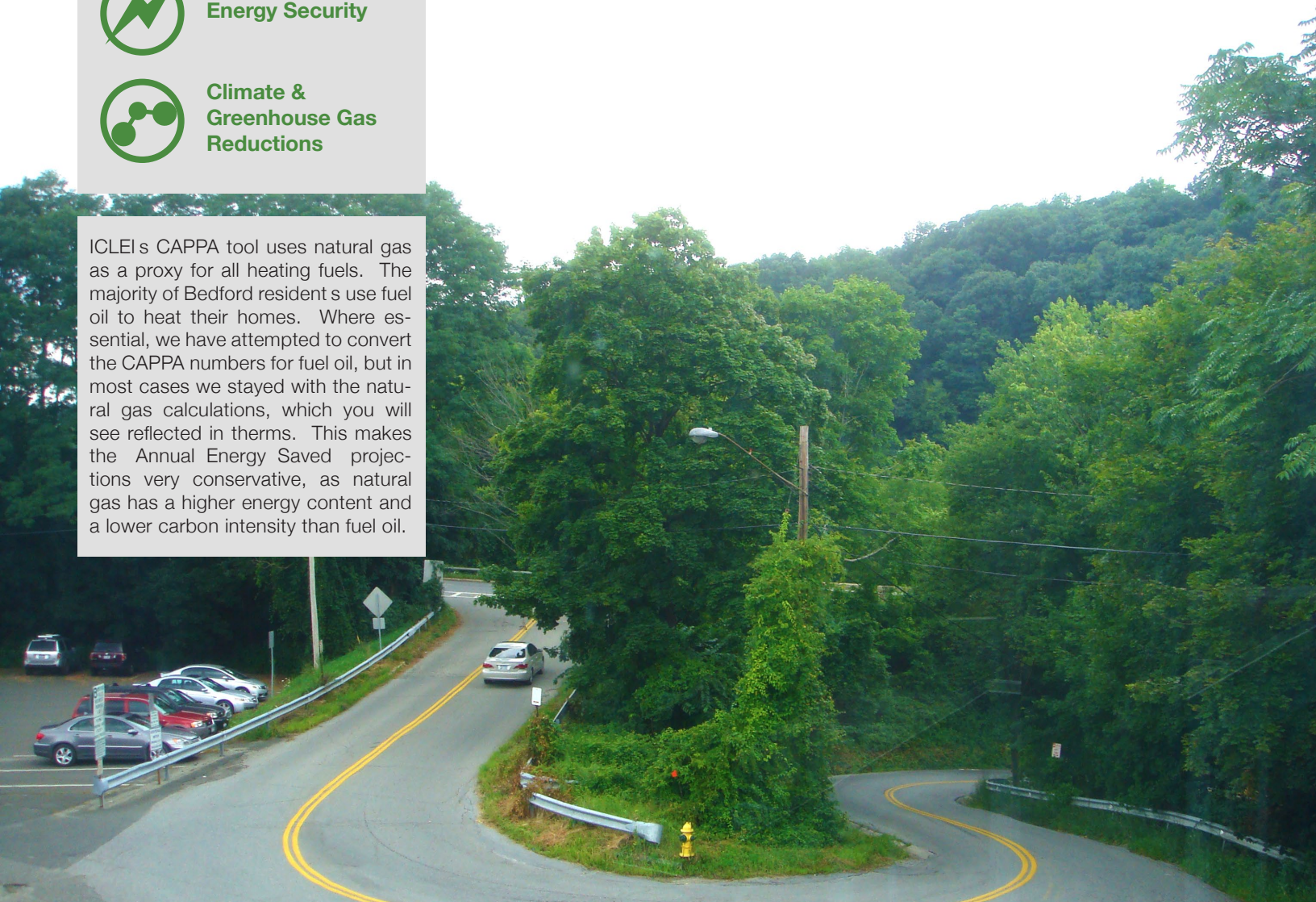
Energy Security

Climate & Greenhouse Gas Reductions

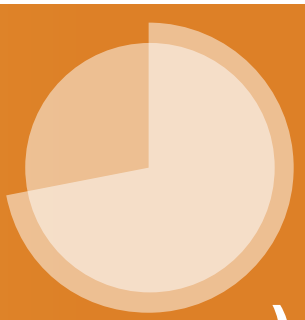
ICLEI s CAPPA tool uses natural gas as a proxy for all heating fuels. The majority of Bedford resident s use fuel oil to heat their homes. Where essential, we have attempted to convert the CAPPA numbers for fuel oil, but in most cases we stayed with the natural gas calculations, which you will see reflected in therms. This makes the Annual Energy Saved projections very conservative, as natural gas has a higher energy content and a lower carbon intensity than fuel oil.

measures for Bedford and determining which to include in our Climate Action Plan. We relied heavily on the measure descriptions provided by ICLEI for our Climate Action Plan (CAP) and tailored them to fit Bedford's needs. CAPPA uses default assumptions regarding resulting performance of each strategy that are based on real-world data from other U.S. communities and a variety of expert sources. These assumptions can be customized to include more accurate local data, which we have done where such data is available.

It is important to note that CAPPA is a tool, designed to highlight the potential of each reduction measure. However, its dependence on assumptions makes it limited by the quantity and quality of available data. Anytime we are able to find more detailed information, we will be adding data, leading to slight changes in our predicted outcomes.



b. Energy



(69.8% of total proposed GHG reductions **)**

In the United States, residential and commercial buildings account for 48% of the country's energy consumption. Furthermore, 75% of a building s lifetime costs are related to this large-scale consumption and its maintenance. In Bedford, the numbers are equally staggering - In 2004 residential, commercial, industrial, institutional and municipal buildings together were responsible for the emission of 186,567 tonnes of CO2e into the atmosphere, making up 68% of the town s total GHG emissions in that year. Of these emissions, about 78% can be attributed to residential structures.

Reducing GHG emissions from building energy use in Bedford will require action in two areas: improving energy efficiency and increasing the number of renewable sources of electricity (such as solar, wind, hydroelectric and geothermal.)

Achieving higher energy efficiency means being smarter about how we design and construct new buildings but also how we retrofit our existing housing and commercial stock. Retrofit recommendations can range from simple to complex including measures such as increasing building insulation; installing more efficient heating, ventilation, and air conditioning (HVAC) equipment; and using more efficient lighting, appliances, and equipment.

The support, research and development of clean, renewable sources of energy are also essential if we are to keep up with our rate of growth and continued demand for energy. Unlike our existing fossil fuel infrastructure, renewables take advantage of infinite, natural and free resources and do not contribute to GHG emissions or air pollution.

The measures contained in this section have the biggest potential to get us to our Twenty by 2020 goal. The implementation of these measures will encourage us to rethink how our homes and offices impact the environment, and how we can live more sustainably and economically with the energy-saving technologies available to us.

total GHG reduction in sector: **135,808 Tonnes CO_2e**

co-benefits:

Municipal Energy Measures

Community Scale Renewable Energy Study

Renewable energy and green energy means the same thing: a process that manufactures electricity for use in our homes and businesses that contributes little or no green house gasses (GHG) to the atmosphere, reduces un-healthful byproducts of burning fossil fuels and helps us reduce the need to import energy fuels from overseas. Renewable energy sources include: solar, wind, hydroelectric, and geothermal.

The Town of Bedford will commence a study to identify all available renewable energy assets in the community as well as opportunity sites where RE projects might best be implemented. In addition, the study would include potential finance options. The results of this study will allow us to move toward increasing renewable energy production locally to at least 10% of total consumption and in the long term to a mix of local and grid renewable energy of 100%.

Total Cost: $215,532 annually
Payback: N/A
Co-Benefits:

Scope

100% participation

Annual Reductions

CO_2e: 803 Tonnes in total Community Emissions and 15% reduction in TOB total Emissions and 75% of 20% by 2020 goal)
Energy: N/A
NOx: 2,145 lbs
SOx: 9,044 lbs
CO: 2,246 lbs
VOCs: 252 lbs
PM10: 1,981 lbs

Energy Efficiency Retrofits of Existing Town Owned Facilities

Town owned buildings account for 74% of total municipal energy use and the resulting GHG emissions attributed to Town operations. Many measures can be applied to existing buildings to improve their efficiency, including using efficient lightbulbs and fixtures, increasing insulation, replacing windows, and upgrading HVAC systems for 15-40% energy savings.

The Town of Bedford will carry out the energy efficiency retrofits and upgrades that were recommended in the 2009 NYSERDA Energy Audit of the exisiting municipal buildings and facilities.

Cost: $42,231
Payback: 3.8 years
Co-Benefits:

Scope

100% of 39,620sq/ft of Town of Bedford building space

Annual Reductions

CO_2e: 177 tonnes (3.3% reduction in total TOB emissions, 4.4% reduction in TOB Building Emissions and 16.5% of 20% by 2020 goal)
Energy: 260,525kWh
14,191 e/therms
$: $42,231
NOx: 498 lbs
SOx: 1,103 lbs
CO: 333 lbs
VOCs: 44 lbs
PM10: 247 lbs

Cost: N/A
Payback: N/A
Co-Benefits: 

Municipal Green Building Policy

The built environment has a profound impact on our natural environment, economy, health and productivity. Breakthroughs in building science, technology and operations are now available to designers, builders, operators and owners who want to build green and maximize both economic and environmental performance.

The US Green Building Council developed LEED (Leadership in Energy & Environmental Design) certification system is the nationally recognized standard for green building. Many cities and counties have adopted ordinances requiring new construction or major renovation of public buildings to follow LEED standards. The LEED system establishes several levels of environmental achievement from a "Certified" rating to a "Silver" rating to a Gold rating to a Platinum rating. The ratings are attained by earning LEED points in the categories of Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality and Innovation & Design Process.

The Town of Bedford is committed to minimizing the short-term and long-term negative impacts construction has on the environment by requiring all new or renovated Town structures to be Certified LEED.

Cost: N/A
Payback: N/A
Co-Benefits: 

Municipal Energy Efficiency Purchasing Policy

Purchasing efficient products reduces energy costs without compromising quality. Local governments may obtain significant reductions in energy bills by adopting a procurement policy that sets a minimum efficiency standard for all new equipment purchased.

The Town of Bedford will propose a municipal policy in which, to the extent possible and in compliance with procurement regulstions, all new appliances, office equipment, electronic equipment, and HVAC infrastructure must be set Energy Star compliant.

Municipal Energy Measures

Energy Efficient/Energy Star Appliances (6)

Total Cost: $5,190
Co-Benefits:

The Town of Bedford will propose the adoption and implementation of a Municipal Green Procurement Policy, in which newly purchased items are considered for the greatest energy efficiency possible. In the case of appliances, that means Energy Star certified.

ENERGY STAR is a partnership between the U.S. Environmental Protection Agency and industry to voluntarily label products that meet certain energy efficiency criteria.

According to the EPA, more than 2 billion ENERGY STAR-certified products have been purchased since 1992, generating utility bill savings of $14 billion in 2006, saving an amount of energy equivalent to the generation capacity of 70 power plants. These energy savings translate to a GHG emissions reduction of 37 million metric tons, equal to removing 25 million vehicles from the road.

This measure includes data for Energy Efficient Computers, Printers, Refrigerators, Vending Machines, Water Coolers and Copiers.

Total Annual Reductions

CO_2e: 28 tonnes
Energy: 76,102 kWh
$: $7,610 annual savings
NOx: 76 lbs
SOx: 320 lbs
CO: 79 lbs
VOCs: 9 lbs
PM10: 69 lbs

1. Computers

Switching to Energy Star monitors and computers use 20-60% less energy than conventional systems.

Cost: $0
Payback: 0 years

Scope

86 Computers Replaced with Energy Star Computers

Annual Reductions

CO_2e: 15 tonnes
Energy: 39,302 kWh
$: $3,930

2. Printers

New Energy Star qualified printers are, on average, 37% more energy efficient than conventional ones. They reduce paper consumption by printing double-sided pages and air conditioning costs by running cooler. A new energy efficient printer yields 28% savings in energy and maintenance costs.

Cost: $3,550 ($50 Incremental Cost)
Payback: 1.8 years

Scope

71 Printers

Annual Reductions

CO_2e: 7 tonnes
Energy: 19,291 kWh
$: $1,929

Cost: $800 ($100 Incremental Cost)
Payback: 2.2 years

Scope
8 Refrigerators replaced

Annual Reductions
CO_2e: 1 tonne
Energy: 3,712 kWh
$: $371

3. Refrigerators

Refrigerators are usually the single biggest electricity user in a home and a significant user at the workplace. ENERGY STAR refrigerators use half the energy of those made before 1993, 40% less than refrigerators made in 2001, and 15% less than required by federal regulation in 2007.

Cost: $0
Payback: 0 years

Scope
2 Vending Machines replaced

Annual Reductions
CO_2e: 1 tonne
Energy: 3,318 kwh
$: $332

4. Vending Machines

As contracts with vendor operators come up for renewal, local governments can negotiate new contracts that include more energy efficient machines that will reduce GHG emissions and cost less to operate. Switching to just one ENERGY STAR-labeled vending machine can reduce municipal CO2 emissions by 25,651.91 lbs over its 14-year lifecycle, equivalent to removing 3.11 cars from the road every year.

Cost: $700 ($100 Incremental Cost)
Payback: 2.8 years

Scope
7 Water Coolers replaced

Annual Reductions
CO_2e: 1 tonne
Energy: 2,527 kwh
$: $253

5. Water Coolers

The office water cooler can use more electricity than a full-size refrigerator. An ENERGY STAR water cooler reduces this energy use by 50%. An ENERGY STAR hot and cold water cooler can save $47 a year in energy, and a cold cooler can save $12 a year. (Coolers that produce both hot and cold water use more energy and offer more potential for savings).

Cost: $140 ($10 Incremental Cost)
Payback: < 1 year

Scope
14 Copiers replaced

Annual Reductions
CO_2e: 3 tonnes
Energy: 7,952 kWh
$: $795

6. Copiers

Today, there are over 220 million imaging equipment units, such as fax machines and copiers, in US buildings. Together, these units consume 40 billion kWh each year, roughly 2% of US building sector electricity consumption. These are often the most energy-intensive type of office equipment because they are left on for long periods of time in some case, 24 hours per day. Models that meet the revised ENERGY STAR imaging equipment criteria will be more efficient and save users money over the lifetime of the product.

Municipal Energy Measures

Heating and Cooling Efficiency (5 Measures)

The Town of Bedford will propose the adoption and implementation of a Municipal Green Procurement Policy, in which newly purchased items are considered for the greatest energy efficiency possible.

Energy used to heat, cool, and ventilate contributes to the majority of energy used in buildings. Improving the efficiency of the equipment used for these tasks reduces emissions and saves on climatization costs. To maximize energy savings, upgrade to the most efficient chillers, boilers, and heating, ventilation, and air conditioning (HVAC) units.

This measure includes data for High Efficiency Water Heaters, Boilers, Chillers, HVAC Fans and Heat and Power Education.

Total Cost: $23,573.20
Co-Benefits:

Total AnnualReductions

CO_2e: 13 tonnes
Energy: 17,240 kWh
1,080 e/therms
$: $2,955
NOx: 35 lbs
SOx: 73 lbs
CO: 22 lbs
VOCs: 3 lbs
PM10: 16 lbs

1. Water Heaters

When Energy Star water heaters are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized. Communities with fossil fuel power plants within their airshed could contribute to the reduction of criteria air pollutants created from electricity generation through such a program. An Energy Star water heater can help reduce energy costs for the facility.

Cost: $5,510
Payback: 8.8 years

Scope

5 Water Heaters replaced

Annual Reductions

CO_2e: 3 tonnes
Energy (annually): 2,870 kWh
296 e/therms
$: $624

2. Boiler Efficiency

When Energy Star boilers are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized. Whether gas or oil, ENERGY STAR qualified boilers use about 6% less energy than a standard boiler. They achieve greater efficiency with improved features, such as electric ignition, which eliminates the need to have the pilot light burning all the time , and new combustion technologies that extract more heat from the same amount of fuel.

Cost: $14,263 ($0.36 Incremental Cost of efficient boilers per sq. ft.)
Payback: 15.9 years

Scope

39,620 Square ft of Facilities with Upgraded Boilers

Annual Reductions

CO_2e: 4 tonnes
Energy: 784 e/therms
$: $894

Cost: $3,600 ($0.36 Incremental Cost of Efficient Chillers per sq. ft.)
Payback: 3.5 years

Scope
10,000 sq ft of facilities with upgraded chillers

Annual Reductions
CO_2e: 4 tonnes
Energy: 10,230 kWh
$: $1,023 annual savings

3. Chiller Efficiency

Air conditioning is one of the largest energy users in commercial buildings. Replacing older chillers with appropriately-sized and the most efficient, new chillers can reduce energy use by 30%.

Cost: $200 ($0.02 Incremental Cost of Efficient Fans per sq. ft.)
Payback: < 1 year

Scope
10,000 sq ft of facilities with upgraded HVAC fans

Annual Reductions
CO_2e: 2 tonnes
Energy: 4,140 kwh
$: $414

4. HVAC Fan Upgrades

HVAC fans, with the help of pumps, transfer heated or cooled air into homes or buildings. When efficient HVAC are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized.

Scope
data unavailable

5. Combined Heat and Power Infrastructure Education

Combined heat and power (CHP), also known as cogeneration, is the simultaneous production of electricity and heat from a single fuel source, such as: natural gas, biomass, biogas, coal, waste heat, or oil.

CHP is the sequential production and use of electricity and thermal energy from a single fuel. CHP is inherently more efficiency than separate generation of electricity from central station power plants and thermal energy from boilers or other heating equipment.

Municipal Energy Measures

Efficient Lighting Retrofits

Lighting is typically the largest electricity user in commercial buildings. Many municipal buildings use fluorescent lighting, which is relatively efficient, but many buildings still have older fixtures with magnetic ballasts and T-12 size fluorescent tubes. New electronic ballasts with T-8 size tubes use 30% less energy and can provide better light quality without flicker.

The town of Bedford will identify lighting inefficiencies in town owned buildings and install more energy efficient lighting where necessary.

Total Cost: $18,621 ($0.47 incremental cost of retrofit $/sq. ft.)
Payback: 5.7 years
Co-Benefits:

Scope

39,620 sq. ft. retrofitted with efficient lighting

Annual Reductions

CO_2e: 12 tonnes
Energy: 32,782 kWh
$: $3,278
NOx: 33 lbs
SOx: 138 lbs
CO: 34 lbs
VOCs: 4 lbs
PM10: 30 lbs

Lighting Occupancy Sensors

Lighting is typically the largest electricity user in commercial buildings. Much energy is wasted by lights left on when no one is using them. Installation of lighting occupancy sensors prevent this by using sensors to detect motion in the lighted space and turning lights off if no one is present. Sensors can reduce energy use for lighting by an average of 35%. When efficient lights and sensors are purchased as a part of a broader green procurement or energy efficiency program, a significant reduction in electricity use can be realized.

The town of Bedford will identify lighting inefficiencies in town owned buildings and facilities and install lighting occupancy sensors where deemed necessary.

Cost: $2,377
Payback: < 1 year
Co-Benefits:

Scope

39,620 sq ft installed with occupancy sensors

Annual Reductions

CO_2e: 35 tonnes (.65% reduction in total TOB Emissions, .9% reduction in TOB Building emissions and 3.3% of 20% by 2020 goal)
Energy: 94,989 kWh
$: $9,499
NOx: 95 lbs
SOx: 399 lbs
CO: 99 lbs
VOCs: 11 lbs
PM10: 87 lbs

Total Cost: $375,000 (before incentives)
$120,000 (after State incentives)
Payback: 60yrs (before State and Federal Incentives)
20 yrs (after State Incentives)
Co-Benefits:

Scope

50 kW of PV Installed

Annual Reductions

CO_2e: 21 tonnes
Energy: 60,000 kWh
$: $6,000
NOx: 57 lbs
SOx: 241 lbs
CO: 60 lbs
VOCs: 7 lbs
PM10: 53 lbs

Use Solar Photovoltaic (PV) Energy

Solar photovoltaic (PV) power harnesses sunlight to generate electricity. By substituting solar energy for fossil fuels, energy can be produced without generating GHG emissions. Solar Electric or PV systems create electricity that can be used in Municipal owned buildings to run appliances, lighting, and central air conditioning just as they would use the power from the utility s electric grid.

The Town of Bedford will examine its town owned buildings to determine the feasibility of installing Solar PV Energy. They will work with NYSERDA (New York State Energy Research and Development Authority) tools to access information about the cost and benefits of solar electric systems, as well as technical assistance for identifying installers and inspectors.

Cost: N/A
Payback: N/A
Co-Benefits:

Consider Solar Hot Water Systems for Town Owned Buildings

Solar Hot Water can help reduce the cost of making hot water in municipal buildings by 50-75%. Solar thermal collectors on the roof absorb the sun s heat and transfer it into a solar storage tank adjacent to your existing hot water heater with the help of a small circulating pump. Solar thermal solutions are great for buildings that may not be eligible for PV systems because they don t requires as much roof space and are less expensive. The Town of Bedford will conduct a feasibility study around the potential for use of solar Hot Water systems on town owned buildings.

33

Community Energy Measures

Energy Efficiency Loans for Residential Buildings

Most homes even some newer ones have not been constructed or tested to building performance standards that conserve energy. Many homes in Bedford are wasting considerable amounts of energy and money and are contributing unnecessary greenhouse gasses to the environment.

The Town of Bedford proposes the formation of a Sustainable Energy loan program, that offers property owners the option to borrow low cost funds to obtain home energy audits and install recommended energy efficiency measures in their buildings and homes. Building owners pay for the cost over a 20-year period through a special tax collected on their property tax bill. These programs allow the town to secure the loan by recording a Special Municipal Property Lien against the property. The Lien secures the owner s obligation to pay the special taxes and secures a pool of lending capital. . A key element of the programs is that they allow the transfer of the loan payments to succeeding property owners, in essence, matching the cost of the energy improvements with the energy savings. The goal of the program is to facilitate energy efficiency retrofits in Bedford's existing residential housing stock to produce 30%+ energy savings throughout the community.

Cost: $54,366,000
Household Cost: $8,500
Payback: Avg 5.4 years
Co-Benefits:

Scope

100% of 6396 homes

Annual Reductions

CO_2e: 46,257 tonnes in Residential GHG emissions. (32% reduction in Residential Emissions and a 17% reduction in total Community Emissions. 83.8% of 20% by 2020 goal.)
Energy: 27,521,348 kWh
6,426,061 e/therms
$: $10,077,845
NOx: 135,345 lbs
SOx: 119,781 lbs
CO: 56,528 lbs
VOCs: 9,161 lbs
PM10: 28,590 lbs

Community Scale Renewable Energy Study

Renewable energy and green energy mean the same thing: a process that manufactures electricity for use in our homes and businesses that contributes little or no greenhouse gasses (GHG) to the atmosphere, reduces un-healthful byproducts of burning fossil fuels and helps us reduce the need to import energy fuels from overseas. Renewable energy sources include: solar, wind, hydroelectric, and geothermal.

The Town of Bedford will commence a study to identify all available renewable energy assets in the community as well as opportunity sites where Renewable Energy projects might best be implemented. In addition, the study would explore potential finance options. The results of this study will allow Bedford to move toward increasing renewable energy production locally to at least 10% of total consumption and in the long term to a mix of local and grid renewable energy of 100%.

Cost: $13,886,000
Payback: N/A
Co-Benefits:

Scope

100% participation

Annual Reductions

CO_2e: 51,753 tonnes (18.75% reduction in total Community Emissions and 93.8% of 20% by 2020 goal)
Energy: N/A
NOx: 138,168 lbs
SOx: 582,667 lbs
CO: 144,695 lbs
VOCs: 16,247 lbs
PM10: 127,615 lbs

Cost: $7,065,000
Payback: 3.7 years
Co-Benefits:

Scope

100% of 2.2mm sq/ft of commercial space - 30% savings

Annual Reductions

CO_2e: 7702 tonnes (2.7% reduction in total Community Emissions and 19.1% reduction in Commercial Emissions and 13.9% of 20% by 2020 goal)
Energy: 13,631,124 kWh
$: $1,896,574
NOx: 21,425 lbs
SOx: 57,509 lbs
CO: 16,232 lbs
VOCs: 2,027 lbs
PM10: 12,767 lbs

Energy Efficiency Retrofits of Existing Commercial Facilities

Buildings account for over 50% of total energy use and the resulting GHG emissions in Bedford. Many measures can be applied to existing buildings to improve their efficiency, including using efficient lightbulbs and fixtures, increasing insulation, replacing windows, and upgrading HVAC systems for 15-40% energy savings.

Sustainable Bedford Coalition will work with Bedford s Commercial and Industrial sectors to inform them about New York State Energy Research and Development Authority s (NYSERDA) programs that provide energy efficiency services for existing buildings, new construction, industrial facilities. NYSERDA programs include: Commercial Energy Audits (http://www.nyserda.org/programs/Technical_Assistance/default.asp), the New Construction Program, Existing Facilities Program, New Renewable, Clean Energy, or Energy Efficiency Product Manufacturing Business Incentive and the New York Energy $mart^{SM} Loan Program.

Cost: $704,000
Payback: < 1 year
Co-Benefits:

Scope

704 Businesses Participating

Annual Reductions

CO_2e: 3,965 tonnes
Energy: 6,818,240 kWh
254,144 e/Therms
$: $971,548
NOx: 11,054 lbs
SOx: 28,779 lbs
CO: 8,206 lbs
VOCs: 1,033 lbs
PM10: 6,396 lbs

Energy Efficiency Education Targeted at Business

Businesses, and particularly small businesses, represent a significant portion of energy use in our community. Businesses can enact many simple measures to save energy. Outreach and education programs that offer information about and encourage conservation measures can tap into this potential.

The Sustainable Bedford Business Task Force will work with the Commercial and Industrial Sectors to develop and implement a technical assistance program around energy efficiency and conservation, including: promotional materials, web resources, best practices sharing, training workshops and expert support. Businesses that show leadership in energy efficiency will be recognized.

California s Flex Your Power program gives awards to recognize businesses showing leadership in energy efficiency and provides information on availble incentives and best pratice guides by industry. For more information, see: http://www.fypower.org/com.

Community Energy Measures

Require Home Energy Rating (HERs) at Time of Sale

Buildings account for over 50% of total energy use and the resulting GHG emissions in Bedford. Many measures can be applied to existing buildings to improve their efficiency, including using efficient lightbulbs and fixtures, increasing insulation, air sealing and upgrading HVAC systems but currently Bedford lacks a standard to compare the relative building performance of our residential stock. In an effort to allow our residents to make informed decisions on where to invest in efficiency and which homes perform with more efficiency, the Town of Bedford will propose a local ordinance requiring that every home or apartment building sold or transferred in Bedford must obtain a Home Energy Rating (HERs) by 2015 and disclose this rating to any potential buyer of said structures. Retrofits to improve the performance of a building would be eligible for financing through the Sustainable Loan Program.

A HERs energy rating provides a standardized evaluation of a home s energy efficiency and expected energy use costs. The evaluation is conducted in accordance with uniform standards and includes a detailed home energy use assessment, conducted by a certified Rater, using an advanced set of nationally accredited energy and economic analysis procedures and verified software tools.

The HERs Index is a scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERs Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERs Index of 0. The lower a home s HERs Index, the more energy efficient it is in comparison to the HERs Reference Home.

Cost: $8,000,000
Payback: 5.1 years
Co-Benefits:

Scope

1000 home transactions in 10yrs

Annual Reductions

CO_2e: 7,236 tonnes (2.6% reduction in total Community Emissions and 4.9% reduction in Residential Emissions and 13.1% of 20% by 2020 goal)
Energy: 4,311,900 kWh
1,004,700 e/therms
$: $1,576,548 ($1,577 per home)
NOx: 21,170 lbs
SOx: 18,765 lbs
CO: 8847 lbs
VOCs: 1433 lbs
PM10: 4478 lbs

Total Cost: $0
Payback: 0 years
Co-Benefits:

Scope

500 Homes weatherized

Annual Reductions

CO_2e: 1,206 tonnes
Energy: 718,500 kWh
167,450 e/therms
$: $262,743
NOx: 3,528 lbs
SOx: 3,127 lbs
CO: 1,474 lbs
VOCs: 239 lbs
PM10: 746 lbs

Promote Existing Home Weatherization Programs to Low Income Households and Seniors

A program to help low-income earners weatherize is a win-win opportunity to reduce emissions while saving money for low-income residents. A weatherization program can reduce energy costs, creating more income to be spent on necessities while, at the same time, reducing GHG emissions due to decreased energy use.

While low-income earners generally have smaller houses and fewer appliances than higher-income earners, their homes are often older and poorly insulated. Low-income weatherization programs seal cracks around windows and doors, add insulation, and sometimes replace inefficient appliances, reducing energy-use-related GHG emissions and lowering utility bills.

Westchester County and NY State offer several free assistance programs for low income household and Seniors. The Town of Bedford will work to promote and increase participation in these existing programs among our qualified residents.

Helping low-income households save money on energy bills, can help improve residents quality of life and the affordability of our community, as well as stimulate the local economy by providing residents extra money to spend on education, leisure or savings.

Community Energy Measures

Bedford Residential Building Energy Code

Buildings account for over 50% of GHG emissions in the Bedford. Design and construction of new buildings, or major renovation of existing ones, provides an opportunity to implement energy saving measures that reduce GHG emissions. Green building design looks at buildings as a complete system to maximize health, comfort, and productivity of occupants while minimizing resource use for construction and operation

The Town of Bedford will propose legislation requiring all new residential dwellings and all renovated residential dwellings where changes are equal or exceed 50% of the dwelling's existing conditioned area to be built to comply with the current New York ENERGY STAR labeled homes requirements. Under this energy code, all applicants seeking a Building Permit for a new subject dwelling shall submit a Town of Bedford New York ENERGY STAR Building Permit affidavit.

A New York ENERGY STAR labeled home uses approximately 30% less energy than conventionally built homes. These savings come from a variety of energy-saving features, doors, high-efficiency heating and cooling systems, and energysaving appliances and lighting. New York ENERGY STAR labeled homes must pass a stringent evaluation, including a computerbased energy analysis, inspections, and certification testing.

Cost: $4000 increased building cost per household
Payback: 2.5 years
Co-Benefits:

Scope

225 new housing units

Annual Reductions

CO_2e: 1,628 tonnes
Energy: 970,178 kWh
226,058 e/therms
$: $354,723
NOx: 4,763 lbs
SOx: 4,222 lbs
CO: 1,991 lbs
VOCs: 322 lbs
PM10: 1,008 lbs

Cost: $4.00 Increased Building Cost ($ per square foot)

Payback: 6.3 years

Co-Benefits:

Scope

50,000 sq. ft. of new construction or renovation

Annual Reductions

CO_2e: 124 tonnes

Energy: 259,500 kWh

4,950 e/therms

$: $31,593

NOx: 341 lbs

SOx: 1,092 lbs

CO: 292 lbs

VOCs: 35 lbs

PM10: 241 lbs

Bedford Commercial Building Energy Code

The built environment has a profound impact on our natural environment, economy, health and productivity. Breakthroughs in building science, technology and operations are now available to designers, builders, operators and owners who want to build green and maximize both economic and environmental performance.

The US Green Building Council developed LEED (Leadership in Energy & Environmental Design) certification system is the nationally recognized standard for green building. Many cities and counties have adopted ordinances requiring new construction or major renovation of public buildings follow LEED standards. The LEED system establishes several levels of environmental achievement from a "Certified" rating to a "Silver" rating to a Gold rating to a Platinum rating. The ratings are attained by earning LEED points in the categories of Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality and Innovation & Design Process.

The Town of Bedford is committed to minimizing the short-term and long-term negative impacts construction has on the environment by proposing legislation requiring all new or renovated subject structures equal to or greater than 5,000 square feet of conditioned area to be Certified LEED. Every applicant shall pay a fee of $0.05 per square foot of the project, not to exceed $15,000, to the Building Department, refundable upon Certification. No certificate of occupancy shall be issued unless the project has received LEED Certification by the United States Green Building Council or the local variant of green building project rating system acceptable to the Building Inspector.

LEED certified buildings cost only about 2% more than equivalent non-green buildings, mostly for design costs, and that premium is decreasing as green building becomes more widespread.

The intent of this legislation is to provide owners and occupants of commercial buildings, offices, industrial buildings, multiple residences of greater than 4 units and senior citizen multiple residences with the economic benefits of energy and water savings, good indoor air quality and healthy, pleasant and productive surroundings. A further intent of this article is to benefit the community by having buildings constructed that are resource-efficient and conserve energy.

Community Energy Measures

Energy Efficient/Energy Star Appliances (7)

Total Cost: $1,083,290
Co-Benefits:

Total Annual Reductions

CO_2e: 4,651 tonnes
Energy: 11,889,923 kWh
$: $1,233,691
NOx: 12,417 lbs
SOx: 45,445 lbs
CO: 12,559 lbs
VOCs: 1,427 lbs
PM10: 10,947 lbs

The Sustainable Bedford Coalition will work with the Residents of Bedford on outreach and education on the merits of purchasing and using Energy Star Appliances in place of older appliances.

ENERGY STAR is a partnership between the U.S. Environmental Protection Agency and industry to voluntarily label products that meet certain energy efficiency criteria.

According to the EPA, more than 2 billion ENERGY STAR-certified products have been purchased since 1992, generating utility bill savings of $14 billion in 2006, saving an amount of energy equivalent to the generation capacity of 70 power plants. These energy savings translate to a GHG emissions reduction of 37 million metric tons, equal to removing 25 million vehicles from the road.

1. Computers

Switching to Energy Star monitors and computers use 20-60% less energy than conventional systems.

Cost: $0
Payback: 0 years

Scope
11,158 Computers Replaced

Annual Reductions
CO_2e: 1,900 tonnes
Energy: 5,099,206 kWh
$: $509,921

2. Printers

New Energy Star qualified printers are, on average, 37% more energy efficient than conventional ones. They reduce paper consumption by printing double-sided pages and air conditioning costs by running cooler. A new energy efficient printer yields 28% savings in energy and maintenance costs.

Cost: $55,790
Payback: < 1 year

Scope
5,579 Printers

Annual Reductions
CO_2e: 521 tonnes
Energy: 1,396,703 kWh
$: $139,670

3. Refrigerators

Refrigerators are usually the single biggest electricity user in a home and a significant user at the workplace. ENERGY STAR refrigerators use half the energy of those made before 1993, 40% less than refrigerators made in 2001, and 15% less than required by federal regulation in 2007.

Cost: $975,000
Payback: 2.2 years

Scope
9,750 Refrigerators

Annual Reductions
CO_2e: 1,686 tonnes
Energy : 4,524,000 kWh
$: $452,400

Cost: $0
Payback: 0 years

Scope
5,200 Dishwashers

Annual Reductions
CO_2e: 422 tonnes
Energy: 543,514 kWh
39,208 e/therms
$: $99,050
Gallons of water: 2,236,000

4. Dishwashers

Energy Star rated dishwashers consume less water as well as less energy. As part of a water conservation program, efficient dishwashers can help reduce the amount of water used and sewer water needed to be treated.

Cost: $0
Payback: 0 years

Scope
100 Vending Machines

Annual Reductions
CO_2e: 62 tonnes
Energy: 165,900 kWh
$: $16,590

5. Vending Machines

As contracts with vendor operators come up for renewal, businesses can negotiate new contracts that include more energy efficient machines that will reduce GHG emissions and cost less to operate. Switching to just one ENERGY STAR-labeled vending machine can reduce a company's CO2 emissions by 25,651.91 lbs over its 14-year lifecycle, equivalent to removing 3.11 cars from the road every year.

Cost: $50,000
Payback: 4.9 years

Scope
500 Water Coolers

Annual Reductions
CO_2e: 38 tonnes
Energy: 102,000 kWh
$: $10,200

6. Water Coolers

The office water cooler can use more electricity than a full-size refrigerator. An ENERGY STAR water cooler reduces this energy use by 50%. An ENERGY STAR hot and cold water cooler can save $47 a year in energy, and a cold cooler can save $12 a year. (Coolers that produce both hot and cold water use more energy and offer more potential for savings).

Cost: $2,500
Payback: < 1 year

Scope
250 Copiers

Annual Reductions
CO_2e: 22 tonnes
Energy: 58,600 kWh
$: $5,860

7. Copiers

Today, there are over 220 million imaging equipment units, such as fax machines and copiers, in US buildings. Together, these units consume 40 billion kWh each year, roughly 2% of US building sector electricity consumption. These are often the most energy-intensive type of office equipment because they are left on for long periods of time in some case, 24 hours per day. Models that meet the revised ENERGY STAR imaging equipment criteria will be more efficient and save users money over the lifetime of the product.

Heating and Cooling Efficiency (6 Measures)

Total Cost: $8,404,689
Co-Benefits:

Total Annual Reductions

CO_2e: 3,821 tonnes
Energy: 2,955,270 kWh
$: $849,127
NOx: 11,099 lbs
SOx: 12,725 lbs
CO: 5,184 lbs
VOCs: 794 lbs
PM10: 2,964 lbs

The Sustainable Bedford Coalition will work with the Residents of Bedford on outreach and education on the merits of energy efficient heating and cooling equipment.

Energy used to heat, cool, and ventilate contributes to the majority of energy used in buildings. Improving the efficiency of the equipment used for these tasks reduces emissions and saves on climatization costs. To maximize energy savings, upgrade to the most efficient chillers, boilers, and heating, ventilation, and air conditioning (HVAC) units.

1. Water Heaters

When Energy Star water heaters are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized. Communities with fossil fuel power plants within their airshed could contribute to the reduction of criteria air pollutants created from electricity generation through such a program. An Energy Star water heater can help reduce energy costs for the facility.

Cost: $7,521,593
Payback: 9.7 years

Scope

6,761 Water Heaters Replaced

Annual Reductions

CO_2e: 3,488 tonnes
Energy: 2,716,570 kWh
441,899 e/therms
$: $775,422

2. Boiler Efficiency

When Energy Star boilers are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized. Whether gas or oil, ENERGY STAR qualified boilers use about 6% less energy than a standard boiler. They achieve greater efficiency with improved features, such as electric ignition, which eliminates the need to have the pilot light burning all the time , and new combustion technologies that extract more heat from the same amount of fuel.

Cost: $794,818
Payback: 15.9 years

Scope

2,207,827 sq ft of facilities upgraded with new boilers

Annual Reductions

CO_2e: 245 tonnes
Energy: 43,715 e/therms
$: $49,835

Cost: $36,000
Payback: 3.5 years

Scope
100,000 sq ft of facilities upgraded with energy efficient chillers

Annual Reductions
CO_2e: 38 tonnes
Energy : 102,300 kWh
$: $10,230

3. Chiller Efficiency

Air conditioning is one of the largest energy users in commercial buildings. Replacing older chillers with appropriately-sized and the most efficient, new chillers can reduce energy use by 30%.

Cost: $50,000
Payback: 5.3 years

Scope
1000 Window Air Conditioners

Annual Reductions
CO_2e: 35 tonnes
Energy: 95,000 kWh
$: $9,500

4. Room Air Conditioners

Nationwide, room air conditioners consume 22 Billion kWh of electricity a year. ENERGY STAR air conditioners use about 10% less energy than new non-ENERGY STAR units. If the air conditioner you are replacing is an older model, the savings can be much greater. A new ENERGY STAR unit can use half the energy of an air conditioner made in the 1970s. To save the most energy, look for the air conditioner with an Energy Star rating and the highest energy efficiency rating (EER).

Cost: $2,000
Payback: < 1 years

Scope
100,000 sq ft of facilities upgraded with energy efficient HVAC fans

Annual Reductions
CO_2e: 15 tonnes
Energy: 41,400 kWh
$: $4,140

5. HVAC Fan Upgrades

HVAC fans, with the help of pumps, transfer heated or cooled air into homes or buildings. When efficient HVAC are purchased as a part of a broader energy efficiency program, a significant reduction in electricity, fuel oil and natural gas use can be realized.

Scope
data unavailable

6. Combined Heat and Power Infrastructure Education

Combined heat and power (CHP), also known as cogeneration, is the simultaneous production of electricity and heat from a single fuel source, such as: natural gas, biomass, biogas, coal, waste heat, or oil.

CHP is the sequential production and use of electricity and thermal energy from a single fuel. CHP is inherently more efficiency than separate generation of electricity from central station power plants and thermal energy from boilers or other heating equipment.

Community Energy Measures

Compact Flourescent Light Bulb (CFL) Distribution

Installing compact flourescent light bulbs (CFLs) is one of the simplest and most cost-effective energy saving measures people can take in their homes. CFLs use about 75% less energy than incandescent bulbs, according to the U.S. Department of Energy. If every home in the U.S. replaced an incandescent bulb with a CFL bulb in just one light fixture, the country would save more than $600 million in energy costs per year, reducing GHG emissions by the equivalent of removing 800,000 cars from the road

One way that the Town of Bedford can encourage community members to purchase CFLs for their homes is to hold promotional CFL giveaway days. Several cities have already partnered with the Federal Government s ENERGY STAR program in their Change a Light, Change the World initiative, which encourages families to replace just one incandescent bulb with a CFL. In addition to the efficient bulbs residents take home, an giveaway raises awareness of the benefits of CLFs, encouraging participants and their neighbors to buy additional bulbs on their own.

Cost: $2,580
Payback: 0.5 years
Co-Benefits:

Scope

1000 lightbulbs exchanged for CFLs

Annual Reductions

CO_2e: 16 tonnes
Energy: 44,000 kWh
$: $4,814
NOx: 44 lbs
SOx: 185 lbs
CO: 46 lbs
VOCs: 5 lbs
PM10: 40 lbs

Efficient Lighting Retrofits

Artificial lighting consumes almost 15% of a household's electricity use and is typically the largest electricity user in commercial buildings. lighting technologies can reduce lighting energy use by selecting lighting and sources that use energy more efficiently, and by installing lighting controls.

The Sustainable Bedford Coalition will work with Bedford s Resdiential and Commercial sectors on outreach and education on the merits of installing energy efficient lighting.

Cost: $1,037,678.69
Payback: 3.3 years
Co-Benefits:

Scope

2,207,827 sq ft retrofitted with efficient lighting

Annual Reductions

CO_2e: 1,184 tonnes
Energy: 3,175,959 kWh
$: $317,596
NOx: 3,160 lbs
SOx: 13,326 lbs
CO: 3,309 lbs
VOCs: 372 lbs
PM10: 2,919 lbs

Cost: $132,469
Payback: < 1 year
Co-Benefits:

Scope

2,207,827 sq ft installed with occupancy sensors

Annual Reductions

CO_2e: 1973 tonnes (.71% reduction in total Community Emissions and 3.6% of 20% by 2020 goal)
Energy (annually): 5,293,265 kWh
$: $529,327
NOx: 5,267 lbs
SOx: 22,211 lbs
CO: 5,516 lbs
VOCs: 619 lbs
PM10: 4,865 lbs

Lighting Occupancy Sensors

Lighting is typically the largest electricity user in commercial buildings. Much energy is wasted by lights left on when no one is using them. Installation of lighting occupancy sensors prevent this by using sensors to detect motion in the lighted space and turning lights off if no one is present. Sensors can reduce energy use for lighting by an average of 35%. When efficient lights and sensors are purchased as a part of a broader green procurement or energy efficiency program, a significant reduction in electricity use can be realized.

The Sustainable Bedford Coalition will work with Bedford s Resdiential and Commercial sectors on outreach and education on the merits of installing lighting occupancy sensors.

Cost: $7,500
Payback: 5 years
Co-Benefits:

Scope

1000 strings of LED lights

Annual Reductions

CO_2e: 6 tonnes
Energy: 15,000 kWh
$: $1,500
NOx: 15 lbs
SOx: 63 lbs
CO: 16 lbs
VOCs: 2 lbs
PM10: 14 lbs

LED Holiday Lights

LED holiday lights use up to 95% less energy than incandescent lights. Each bulb in a light string is small, but together, with several strings per home, they can draw a lot of energy. One string can use 150 watts, or 16 kWh over the holiday season, while an LED string will use less than 1 kWh.

The Sustainable Bedford Coalition will work with Bedford s Resdiential and Commercial sectors on outreach and education on the merits of installing LED holiday lights.

Community Energy Measures

Solar Photovoltaic (PV) Energy

Solar photovoltaic (PV) power harnesses sunlight to generate electricity. By substituting solar energy for fossil fuels, energy can be produced without generating GHG emissions. Solar Electric or PV systems create electricity that can be used in your home or business to run your appliances, lighting, and central air conditioning just as you would use the power from your utility s electric grid.

NYSERDA (New York State Energy Research and Development Authority) has several tools to help inform consumers about costs, installation and incentives.

The Sustainable Bedford Coalition will move to educate and encourage installation of Solar PV systems on community buildings.

Cost: $13,475,000
(before incentives)
$6,737,000 (after State incentives)
$2,694,000 (after State and Federal Incentives)
Payback: 60 years (before State incentives)
12 years (after State incentives)
Co-Benefits:

Scope

1,925 KW of PV Installed

Annual Reductions

CO_2e: 825 tonnes
Energy: 2,220,000 kWh
$: $222,000
NOx: 2,202 lbs
SOx: 9,287 lbs
CO: 2,306 lbs
VOCs: 259 lbs
PM10: 2,034 lbs

Solar Hot Water

Solar Hot Water can help reduce the cost of making hot water in your home or business by 50-75%. Solar thermal collectors on the roof absorb the sun s heat and transfer it into a solar storage tank adjacent to your existing hot water heater with the help of a small circulating pump.

Solar thermal solutions are great for homeowners that may not be eligible for PV systems because they don t requires as much roof space and are less expensive. Although state rebates are not applicable to solar thermal systems, both Federal and State Tax Credits are available. A 25% state tax credit (capped at $5,000) and a 30% federal tax credit (with no cap) are available for homeowners in NY.

The Sustainable Bedford Coalition will move to educate and encourage instalation of Solar Hot Water systems on town community buildings.

Cost: $1,365,000 ($2,100 per home)
Payback: 14 years
Co-Benefits:

Scope

650 Homes

Annual Reductions

CO_2e: 454 tonnes
Energy: 211,413 kWh
66,985 e/therms
$: $97,504
NOx: 1,336 lbs
SOx: 932 lbs
CO: 511 lbs
VOCs: 87 lbs
PM10: 229 lbs

Cost: $1,201,500 ($1,350 per home)
Payback: 1.7 year
Co-Benefits:

Scope

890 Homes

Annual Reductions

CO_2e: 1,889 tonnes
Energy: 12,791,970 kWh
$: $693,481
NOx: 4,096 lbs
SOx: 53,331 lbs
CO: 11,102 lbs
VOCs: 1,022 lbs
PM10: 11,492 lbs

Switch Electric Heat to Natural Gas

Energy used to heat, cool, and ventilate contributes to the majority of energy used in buildings. Using electricity for heat is only about one third as efficient as burning fuel directly for heat. Facilities with electric resistance heat can reduce emissions and save money on heating by switching to natural gas or propane, as electric heating is inherently inefficient.

Cost: $50,000 (5,000 per unit, increased building cost)
Payback: 7.1
Co-Benefits:

Scope

10 Efficient affordable housing units

Annual Reductions

CO_2e: 29 tonnes
Energy: 51,400 kWh, 1,700 e/therms
$: $7,078
NOx: 80 lbs
SOx: 217 lbs
CO: 61 lbs
VOCs: 8 lbs
PM10: 48 lbs

Energy Efficient Affordable Housing

Buildings account for over 55% of GHG emissions in the Bedford. Design and construction of new buildings, or major renovation of existing ones, provides an opportunity to implement energy saving measures that reduce GHG emissions. Green building design looks at buildings as a complete system to maximize health, comfort, and productivity of occupants while minimizing resource use for construction and operation

The Town of Bedford will propose legislation requiring all new affordable housing (four family and greater) and all renovated residential dwellings for the purposes of affordable housing (four family and greater), where changes are equal or exceed 50% of the dwelling's existing conditioned area to be built to comply with the LEED certified requirements. Under this certification, all applicants seeking a Building Permit to build affordable housing units shall submit to the Town of Bedford New York a LEED Building Permit affidavit.

Community Energy Measures

Residential Construction Feebate Program

Cost: unavailable
Payback: unavailable
Co-Benefits:

Residential buildings are responsible for over 50% of Bedford's greenhouse gas emissions, and Bedford s residents and businesses now spend at least $25 million each year to heat, cool and power our buildings. The Town s goal to reach a 20% reduction of GHG (Greenhouse gas) emissions by 2020 must be achieved with an outlook on future new construction performance. Because buildings last for many decades, today s decisions will affect Bedford for the next century or more. Each building represents an opportunity to strengthen Bedford s future. Only 25% of the lifetime costs associated with a building represent construction and finance while three quarters of lifetime costs occur after construction and financing is complete. Many of these lifetime costs consist of energy and fuel inputs. High performance efficient buildings offer one of the best solutions to improve environmental performance while strengthening the local economy and keeping buildings affordable in the long term.

For new residential construction projects, the program proposes a green building feebate a market-based instrument that combines a fee for buildings with elevated GHG emissions, a waiver option for efficiency and GHG emission levels consistent with community goals and a reward for high performance efficiency building projects with low GHG emissions. The feebate concept is not a tax and shouldn t be confused with traditional revenue raising processes. A Feebate is crafted to be a revenue neutral policy that encourages the adoption of a municipal goal through market-based incentives. In the case of this Program, new buildings that have CO2 emissions below the Town of Bedford s Baseline Level of CO2 Emissions are paid a rebate. This rebate originates from the same funding pool new buildings pay fees into if their level of CO2 emissions is over the Baseline Level. New residential buildings that have emissions at or close to the Baseline would pay or receive nothing.

Accellerate Permitting Process for Green Buildings

Cost: unavailable
Payback: unavailable
Co-Benefits:

The Town of Bedford recognizes that green building design and construction have a significant impact on our greenhouse gas reduction goals and create healthier buildings for the people who live and work in our community. The town will propose that all applicants seeking a Building Permit receive accelerated procesing service for building applictions that show the building project to be built to a higher energy efficiency and/or LEED standard than required by Town code.

Cost: unavailable
Payback: unavailable
Co-Benefits:

Smart Grid

In today s electricity markets, a consumer that can measurably reduce electric consumption on demand, is in a position to be compensated as if they were a power plant, and sell into the more lucrative peak demand market. The aspect of the Smart Grid of interest to our community is that users of electricity will be provided automated tools to manage their electricity consumption, and will be paid to do so. Automatically turning an appliance off (i.e. your pool pump, an air conditioner, etc.), on a moment s notice, for a limited time, has exactly the same effect as turning a power plant on, on a moment s notice. Last year, end-users and their representatives were paid more than a billion dollars to shave their electric use at peak times , times at which consumption was unusually heavy. This developing demand response industry has reduced the need to switch on older, inefficient power plants on short notice, and reduced the need to construct new plants, and is a critical piece of an electricity generation future which relies more and more on variable sources like wind. As a result of a new Department of Energy push, supported by legislation now making its way through Congress, within six- to twelve months our appliance stores will carry appliances that are labeled with a Smart Appliance tag. These appliances will be valuable to a Smart Grid participating community. The Town of Bedford and the Sustainable Bedford Coalition will work to educate our residents and position our community to receive the maximum benefit from the regional and nationwide move to Smart Grid infrastructure.

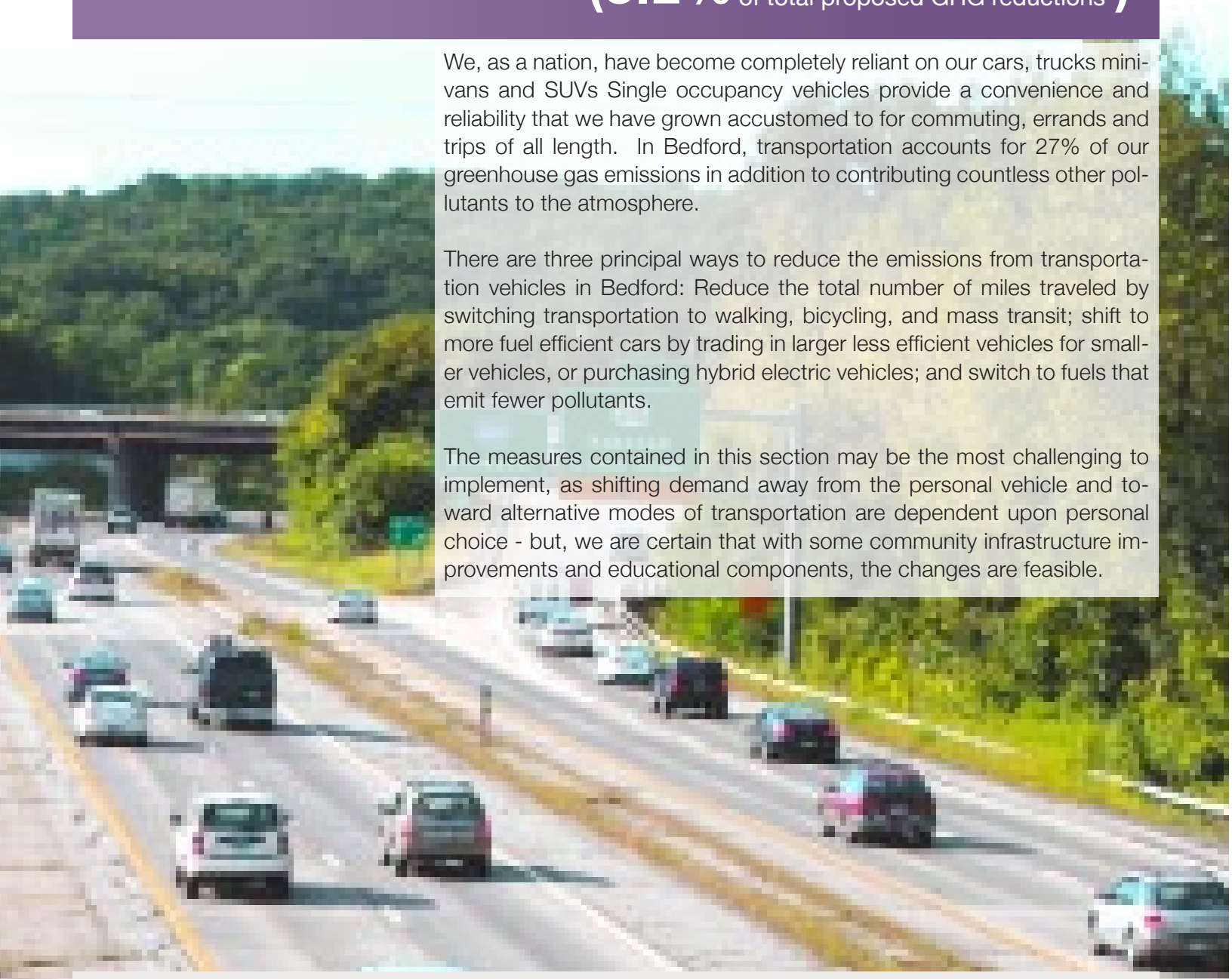
Cost: N/A
Payback: N/A
Co-Benefits:

Odinance Review for Renewable Energy Installation

Many local governments have strict local ordinances and codes that were originally put in place to protect the beauty and character of their town, but that unwittingly prevent residents and businesses from installing renewable energy systems. The Town of Bedford will review all current town ordinances and codes to identify and remove any direct or indirect barriers that would restrict the use of renewable energy or in any way impede the goals of the Climate Action Plan.

c. Transportation

(8.2% of total proposed GHG reductions **)**



We, as a nation, have become completely reliant on our cars, trucks minivans and SUVs Single occupancy vehicles provide a convenience and reliability that we have grown accustomed to for commuting, errands and trips of all length. In Bedford, transportation accounts for 27% of our greenhouse gas emissions in addition to contributing countless other pollutants to the atmosphere.

There are three principal ways to reduce the emissions from transportation vehicles in Bedford: Reduce the total number of miles traveled by switching transportation to walking, bicycling, and mass transit; shift to more fuel efficient cars by trading in larger less efficient vehicles for smaller vehicles, or purchasing hybrid electric vehicles; and switch to fuels that emit fewer pollutants.

The measures contained in this section may be the most challenging to implement, as shifting demand away from the personal vehicle and toward alternative modes of transportation are dependent upon personal choice - but, we are certain that with some community infrastructure improvements and educational components, the changes are feasible.

total GHG reduction in sector: **15,922 Tonnes CO_2e**

co-benefits:

Municipal Transportation Measures

Use Smaller Fleet Vehicles

One easy way to improve the efficiency of vehicles is simply to use a smaller one. The smallest vehicle that can accomplish a task will usually be the most efficient. When considering a vehicle purchase, identify whether an SUV or full-size sedan is actually necessary, or whether a compact car can do the same job.

The Town of Bedford will explore the use of smaller vehicles, scooters and small electric vehicles for inclusion it its municipal fleet.

Cost: N/A
Co-Benefits:

Scope
11 smaller vehicles

Annual Reductions
CO_2e: 9 tonnes
Gasoline: 920 gallons
$: $1,840
NOx: 3 lbs
CO: 622 lbs
VOCs: 65 lbs

Promote Carpooling and Vanpooling

Sharing a car or van to get to work is much more efficient than driving to work alone. The Town of Bedford proposes the initiation of incentives for those municipal employees who significantly reduce their vehicle miles traveled. Employees could reach this goal by car-pooling, van-pooling, using public transportation, and biking or walking to work. Incentives can range from free lunch once a month to cash bonuses or extra time off. In addition, their personal savings at the gas station will be significant.

Cost: N/A
Co-Benefits:

Scope
12 employees

Annual Reductions
CO_2e: 1 tonne
Vehicle Miles: 2,880 mi.
Gasoline: 146 gallons
$: $292
CO: 99 lbs
VOCs: 10 lbs

Police on Bicycles

Reducing the use of vehicles in government operations reduces GHG emissions. Police cars are usually heavy cars with large engines that get poor mileage and produce a large amount of GHG emissions per vehicle. Bicycles, on the other hand, produce no emissions. Studies have shown police on bicycles to be more effective than police in cars. Police on bicycles are more approachable, better able to connect with the public, and better able to observe what is happening. Also, police on bicycles can pursue suspects in places where cars can t go.

Cost: $1,000 cost of bike and training
Payback: N/A
Co-Benefits:

Scope
3 officers on bicycles

Annual Reductions
CO_2e: 21 tonnes
Gasoline: 2,258 gallons
$: $20,400
NOx: 7 lbs
CO: 1,526 lbs
VOCs: 160 lbs
PM10: 3 lbs

Cost: $45,000 (for 15 Hybrids)
Payback: 4.3 years
Co-Benefits:

Scope

Replace 15 conventional-powered vehicles with 15 hybrids.

Annual Reductions

CO_2e: 49 tonnes
Gasoline: 5,250 gal.
$: $10,500
NOx: 16 lbs
SOx: 1 lb
CO: 3,549 lbs
VOCs: 372 lbs
PM10: 8 lbs

Hybrid Vehicles in Municipal Fleet

The Town of Bedford will set a goal to add 15 hybrids vehicles to the municipal fleet over the next ten years. Hybrid/electric vehicles couple an electric drive with a gasoline engine. They are widely available and are suited for a variety of applications. Electric drivetrains are much more efficient than the drivetrains used on standard internal combustion engine vehicles. Automakers are increasingly making hybrid/electric versions of existing models available.

Town vehicles powered by alternative technologies should be labelled as such with an appropriate logo, to promote and reinforce an energy efficiency message to the public, thereby encouraging citizens to follow the lead of the Town when buying their next vehicle.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

58,943 gallons per year switched from diesel to biodiesel

Annual Reductions

CO_2e: 46 tonnes
NOx: -42 lbs
SOx: 50 lbs
CO: 296 lbs
VOCs: 183 lbs
PM10: 29 lbs

Fleet Conversion to Biodiesel (B20)

Using biodiesel in municipal fleet vehicles is a simple and effective way to achieve large reductions in CO2 emissions from fleet operations. Garbage trucks, snowplows, fire trucks, maintenance vehicles, and transit buses are all good options for using biodiesel. There is no need to convert the vehicles, so there is no capital cost to the switch. Biodiesel can be used by itself (called B100 for 100% biodiesel), or mixed with petroleum diesel. A popular mix is B20, 20% biodiesel with 80% petroleum diesel.

Town vehicles powered by alternative technologies should be labelled as such with an appropriate logo, to promote and reinforce an energy efficiency message to the public, thereby encouraging citizens to follow the lead of the Town when buying their next vehicle.

Municipal Transportation Measures

Enforce Weschester County s Anti-Idling Law for Town Owned Trucks

On February 10, 2009, Westchester County adopted the Anti Idling Law to limit idling, when a vehicle is not in motion, to three consecutive minutes. This applies to all municipal vehicles with the exception of emergency vehicles and other external conditions. Idling a diesel vehicle for one hour a day is equivalent in engine wear to driving 64,000 miles and using over 500 gallons of fuel annually. Gasoline wasted while idling is the equivalent of 22 lbs of eCO2 for every hour of idling.

The Town of Bedford will enforce the anti idling restriction throughout its non-emergency municipal fleet. In addition to the measurable ghg savings that come from idling reduction, there are significant health benefits to improving air quality as studied by the American Cancer Foundation and the EPA.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

24 vehicles

Annual Reductions

CO_2e: 27 tonnes
Diesel: 2,880 gallons
$: $7,200
NOx: 103 lbs
SOx: 14 lbs
CO: 131 lbs
VOCs: 42 lbs
PM10: 14 lbs

Compressed Natural Gas (CNG) Vehicles

Natural gas is a clean-burning alternative to gasoline or diesel for municipal and private fleet vehicles. While natural gas is a fossil fuel, it has lower carbon emissions per unit of energy than gasoline or diesel.

Town vehicles powered by alternative technologies should be labelled as such with an appropriate logo, to promote and reinforce an energy efficiency message to the public, thereby encouraging citizens to follow the lead of the Town when buying their next vehicle.

Cost: $2,500 ($500 per vehicle)
Payback: 1.6 years
Co-Benefits:

Scope

5 vehicles

Annual Reductions

CO_2e: 6 tonnes
Gasoline: 2,667 gallons
$: $1,533
NOx: 4 lbs
SOx: 0 lbs
CO: 1,488 lbs
VOCs: 182 lbs
PM10: 3 lbs

Cost: $50,000 ($10,000 incremental cost per EV)
Payback: 18.7 years
Co-Benefits:

Scope

5 EVs

Annual Reductions

CO_2e: 16 tonnes
Energy: -33,417 kWh
Gasoline: 3,011 gal.
$: $2,679
NOx: -24 lbs
SOx: -140 lbs
CO: 2,000 lbs
VOCs: 210 lbs
PM10: -26 lbs

Electric Vehicles

Electric vehicles (EVs) will have a major impact on our fuel reduction. The Town of Bedford will encourage the use of electric vehicles with plug-in charging stations for commuter parking lots and other high traveled areas. The Town will explore the cost of plug-in installations and do a cost analysis for implementation.

Town vehicles powered by alternative technologies should be labelled as such with an appropriate logo, to promote and reinforce an energy efficiency message to the public, thereby encouraging citizens to follow the lead of the Town when buying their next vehicle.

Cost: unavailable
Payback: unavailable
Co-Benefits:

Scope

10 additional employees daily transit passengers

Annual Reductions

CO_2e: 17 tonnes
Gasoline: 2,388 gal.
Energy: -14,219 kWh
Vehicle Miles: 47,040 mi
$: $4,776
NOx: -7 lbs
SOx: -59 lbs
CO: 1,599 lbs
VOCs: 168 lbs
PM10: -10 lbs

Increase Rail Transit Ridership

Rail transit is much more efficient than personal automobiles. Encouraging people to switch to taking the train for their daily commute reduces emissions and local air pollution.

The Sustainable Bedford Coalition will conduct a transportation survey to determine commuter patterns among the Town of Bedford employees. The results will allow them to target education and encourage the use of rail transit, where possible.

Community Transportation Measures

Use Smaller Fleet Vehicles

One easy way to improve the efficiency of vehicles is simply to use a smaller one. The smallest vehicle that can accomplish a task will usually be the most efficient. When considering a vehicle purchase, identify whether an SUV or full-size sedan is actually necessary, or whether a compact car can do the same job.

In some communities, exhaust from cars and light trucks are the single biggest cause of local air pollution. Using fuel more efficiently reduces this pollution.

In addition to reducing emissions and saving on fuel costs, smaller vehicles usually have a lower price.

Sustainable Bedford Coalition will work to educate and inform the community about the benefits of using smaller cars.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

6,410 smaller vehicles replacing larger cars

Annual Reductions

CO_2e: 4,738 tonnes
Gasoline: 505,408 gal.
$: $1,006,816
NOx: 1,504 lbs
SOx: 98 lbs
CO: 340,315 lbs
VOCs: 35,690 lbs
PM10: 732 lbs

Integrate Bicycles and Transit

Bicycles are the most efficient mode of transportation. They produce no air pollution and place minimal burdens on natural resources. Bicycles are especially appropriate in reducing the number of short trips—up to five miles or so which constitute more than half of all driving. But bicycles can also serve longer trips, on their own or in combination with bus and rail. Combining bicycles with transit can extend the use of both, allowing transit to be used when the destination is too far from a transit stop for walking. A survey found that 30% of users of bike lockers at a transit station in Vancouver, BC had not used transit before the lockers were installed.

The Town of Bedford proposes to work with Metro North Transit systems to provide bike lockers or other secure facilities at stations and stops, as well as design stations with bike ramps and other amenities.

Cost: unavailable
Payback: unavailable
Co-Benefits:

Scope

2400 additional daily bike/transit trips replacing cars

Annual Reductions

CO_2e: 4,036 tonnes
Vehicle Miles: 10,512,000 mi
Gasoline: 533,604 gal.
$: $1,087,208 annual savings @ $2 a gallon
NOx: -1041 lbs
SOx: -11,007 lbs
CO: 357,969 lbs
VOCs: 37,521 lbs
PM10: -1657 lbs

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

4,886 employees offered carpool and vanpool incentives

Annual Reductions

CO_2e: 2,241 tonnes
Vehicle Miles: 4,690,560 mi
Gasoline: 238,099 gallons
$: $476,199
NOx: 711 lbs
SOx: 46 lbs
CO: 160,960 lbs
VOCs: 16,880 lbs
PM10: 346 lbs

Promote Carpooling and Vanpooling

One way to change transportation behavior is to offer incentives for commuting alternatives. The Sustainable Bedford Coalition will explore incentives for Bedford that will be based both on public education and on creating more user friendly mass transit systems and bicycle and pedestrian zones. Education will cover both cost savings to households and the health benefits, both personal and to the community at large

Sharing a car or van to get to work is much more efficient than driving to work alone. Less fuel is used per passenger and vehicle costs are spread over more than one person.

Metropool s NuRide program, available in Westchester County, is a free on-line ridesharing match, in which members are rewarded for carpooling and vanpooling. For more information, visit www.nuride.com

Cost: $6,500
Payback: 0 years
Co-Benefits:

Scope

6500 households targeted

Annual Reductions

CO_2e: 1,100 tonnes
Vehicle Miles: 2,302,186 mi
Gasoline: 116,862 gal.
$: $233,724
NOx: 349 lbs
SOx: 23 lbs
CO: 79,001 lbs
VOCs: 8,285 lbs
PM10: 170 lbs

Education on Low-carbon Transportation Options

Educational and marketing efforts can have a significant effect in getting people to choose other transportation modes besides driving, in many cases comparable to the effect of much more expensive system upgrades. Successful marketing efforts involve a two-way flow of information, finding out what people want in transit and what information will help them use it.

Individualized marketing has been particularly successful, surveying people to find out their interest in automobile alternatives, then sending targeted information they request about what is available in their particular location.

Promotion of a variety of transportation options (transit, ridesharing, walking, bicycling) is more effective than just providing information on a single mode. A multi-modal access guide can help people find a car-free way from starting point to destination.

Community Transportation Measures

Increase Ownership of Hybrid Vehicles

This measure proposes to increase ownership of hybrids by 500 vehicles over the next ten years. Currently, hybrids are the most fuel efficient cars in each size class. The Town of Bedford offers a financial incentive in its two commuter lots for owners of hybrid vehicles. Under this program, residents who own a hybrid receive a $50 annual incentive at the time of permitting. The Town of Bedford, working with the Sustainable Bedford Coalition will explore opportunities to educate Bedford residents about the benefits of hybrid vehicles, and to offer additional incentive programs to increase ownership.

Hybrid/electric vehicles couple an electric drive with a gasoline engine and are widely available and are suited for a variety of applications. Electric drivetrains are much more efficient than the drivetrains used on standard internal combustion engine vehicles. automakers are increasingly making hybrid/electric versions of existing models available.

Cost: $1,500,000 ($3,000 incremental cost per vehicle)
Payback: 6.8 years
Co-Benefits:

Scope

Increase number of hybrids used by 500

Annual Reductions

CO_2e: 1,031 tonnes
Gasoline: 109,565 gal.
$: $219,130
NOx: 327 lbs
SOx: 21 lbs
CO: 74,068 lbs
VOCs: 7,768 lbs
PM10: 159 lbs

Increase Bike and Pedestrian Infrastructure, Create Bicycle Friendly Zones

Dedicated bike paths and bicycle lanes on roadways reduce the danger motor vehicles pose to bicyclists. They also make bicycling faster and more pleasant. Well-maintained surfaces, good lighting, a feeling of security, and strategic locations constitute the elements of a good bicycle route network. Adding crossing signals specifically for bicycles at major roads also helps to ensure efficient flow on the bike path network as well as providing greater safety for bicyclists at dangerous road interfaces.

The Sustainable Bedford Coalition will work with the town s Bicycle Advisory committee to widen the shoulder of important commuting roads, to foster greater coordination with the Bicycle Advisory committee of additional projects and expansion ideas, to tie new development permits to creating bike paths linked to adjacent public and private ways, and to encourage area stores to create a bicycle incentive program. (This will also encourage local shopping).

Cost: unavailable
Payback: unavailable
Co-Benefits:

Scope

16,800 weekly trips switching from car to bicycle

Annual Reductions

CO_2e: 835 tonnes
Vehicle Miles: 1,747,200 mi
Gasoline: 88,690 gal.
$: $177,381
NOx: 265 lbs
SOx: 17 lbs
CO: 59,957 lbs
VOCs: 6,288 lbs
PM10: 129 lbs

Cost: unavailable
Payback: unavailable
Co-Benefits:

Scope

500 weekly trips switching from car to walking

Annual Reductions

CO_2e: 6 tonnes
Vehicle Miles: 13,000 mi
Gasoline: 660 gal.
$: $1,320
NOx: 2 lbs
SOx: 0 lbs
CO: 446 lbs
VOCs: 47 lbs
PM10: 1 lbs

Create Pedestrian Friendly Zones and Increase Hamlet Sidewalks

Walking brings health and environmental benefits, reduces traffic congestion, and brings customers to business along the walking routes. Planning that prioritizes pedestrian needs will require a different design from that which prioritizes vehicles. People are more likely to walk in interesting and safe environments. This implies things like attractive sidewalks, barriers between pedestrians and traffic, slowing down traffic, etc.

The Sustainable Bedford Coalition proposes working with the Town of Bedford to create walkways and pedestrian-friendly outdoor areas linked to adjacent public and private ways. They will also work with area merchants to encourage pedestrian traffic, which increases local business and keeps dollars in our local economy.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

383,250 gallons per year switched from diesel to biodiesel (B20)

Annual Reductions

CO_2e: 300 tonnes
NOx: -275 lbs
SOx: 323 lbs
CO: 1923 lbs
VOCs: 1191 lbs
PM10: 190 lbs

Fleet Conversion to Biodiesel (B20)

Using biodiesel instead of gasoline is a simple and effective way to achieve large reductions in CO2 emissions from vehicles. There is no need to convert the vehicles, so there is no capital cost to the switch. Biodiesel can be used by itself (called B100 for 100% biodiesel), or mixed with petroleum diesel. A popular mix is B20, 20% biodiesel with 80% petroleum diesel.

Community Transportation Measures

Enforce Westchester County s Anti-Idling Law for Trucks

On February 10, 2009, Westchester County adopted the Anti Idling Law to limit idling, when a vehicle is not in motion, to three consecutive minutes. This law applies to all non emergency vehicles, including school buses on school property and venders doing business in the County of Westchester. Idling a diesel vehicle for one hour a day is equivalent in engine wear to driving 64,000 miles and using over 500 gallons of fuel annually. Gasoline wasted while idling is the equivalent of 22 lbs of eCO2 for every hour of idling.

The Town of Bedford will enforce Westchester County s anti-idling law for all commercial trucks doing business in the town. The town should track tickets issued and prohibit excessive offenders from doing business in the town.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

233 vehicles

Annual Reductions

CO_2e: 266 tonnes
Diesel: 27,960 gallons
$: $69,900
NOx: 1,001 lbs
SOx: 138 lbs
CO: 1,276 lbs
VOCs: 412 lbs
PM10: 137 lbs

Enforce Westchester County s Anti-Idling Law for all Non-Emergency Cars

On February 10, 2009, Westchester County adopted the Anti Idling Law to limit idling, when a vehicle is not in motion, to three consecutive minutes. This applies to all vehicles with the exception of emergency vehicles and several other external conditions, including temperatures below 32 degrees F.

The Sustainable Bedford Coalition will work with Westchester County to create and distribute information on the County s Anti-Idling Law to the residents of The Town of Bedford.

Cost: N/A
Payback: N/A
Co-Benefits:

Cost: $384,000 ($3,000 Incremental cost of CNG Vehicle)
Payback: 8.5 years
Co-Benefits:

Scope
128 vehicles

Annual Reductions
CO_2e: 184 tonnes
Gasoline: 78,242 gal.
$: $44,989
NOx: 113 lbs
SOx: 11 lbs
CO: 43,669 lbs
VOCs: 5,340 lbs
PM10: 94 lbs

Compressed Natural Gas (CNG) Vehicles

Natural gas is a clean-burning alternative to gasoline or diesel for municipal and private fleet vehicles. While natural gas is a fossil fuel, it has lower carbon emissions per unit of energy than gasoline or diesel.

The Sustainable Bedford Coalition will explore how to bring the necessary infrastructure (pumping stations) to The community and promote the merits of CNG vehicles.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope
796 additional daily bus passengers

Annual Reductions
CO_2e: 181 tonnes
Vehicle Miles: 1,162,160
Gasoline: 58,993 gal
Diesel: -39,318 gal
NOx: -1232 lbs
SOx: -183 lbs
CO: 38,087 lbs
VOCs: 3603 lbs
PM10: - 107 lbs

Increase School Bus Ridership

The Sustainable Bedford Coalition will work with the Bedford Central and Katonah Lewisboro School Districts to launch an education program on the cost and health benefits to parents, their families, and the community by increasing student use of buses or carpooling measures.

Community Transportation Measures

Initiate a Carshare

Carsharing provides an alternative by allowing access to a car when needed, at a per-mile or hourly charge. For people who use a car infrequently, a carshare program is much less expensive than car ownership. People who participate in a carshare program drive 30-60% less than people who own cars.

Carsharing encourages a reduction in vehicle miles by shifting the fixed costs of car ownership to costs people think about each time they make a choice beteen driving and another transportation mode.

Zipcar is an example of a successful private company working with communities to reduce VMT. Zipcar has 180,000 members in many US and some European cities. It reports member driving reductions from 5295 miles/year before joining to 369 miles/year after.

For more information, see: www.zipcar.com

Cost: $1.10 Costshare per mile
Payback: N/A
Co-Benefits:

Scope

200 carshare participants

Annual Reductions

CO_2e: 172 tonnes
Vehicle Miles: 360,000 mi
Gasoline: 18,274 gal.
$: $36,548 (+ $636,000 avoided cost of car ownership)
NOx: 55 lbs
SOx: 4 lbs
CO: 12,354 lbs
VOCs: 1,296 lbs
PM10: 27 lbs

Electric Vehicles

Electric vehicles will have a major impact on our fuel reduction. The Town of Bedford will encourage the use of electric vehicles with plug-in charging stations for commuter parking lots and other high traveled areas. The Town will explore the cost of plug-in installations and do a cost analysis for implementation.

Cost: $1,000,000 ($10,000 incremental cost of each vehicle)
Payback: 35.1 years
Co-Benefits:

Scope

100 electric vehicles

Annual Reductions

CO_2e: 169 tonnes
Gasoline: 32,000 gal.
Energy: - 355,200 kWh
$: $28,480
NOx: - 258 lbs
SOx: -1,484 lbs
CO: 21,263 lbs
VOCs: 2,227 lbs
PM10: -280 lbs

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

100 additional daily transit passengers

Annual Reductions

CO_2e: 132 tonnes
Vehicle Miles: 357,700 mi
Gasoline: 18,157 gal
Energy: - 108,127 kWh
$: $36,314
NOx: -53 lbs
SOx: -450 lbs
CO: 12,162 lbs
VOCs: 1,275 lbs
PM10: -73 lbs

Increase Rail Transit Ridership

Bedford is currently close to capacity on parking permits. To increase ridership by Bedford residents and neighboring towns to NYC or other stations in the County, the town will need to explore the option of additional parking. A thorough cost analysis will need to be completed along with engaging the partnership of the MTA in this long-term project.

The town will also explore the feasibility of a jitney service that will pick riders up at convenient locations and take them to the area train stations. The town will research successful local models such as the Housatonic Area Regional Transit (HART) shuttle that transports Ridgefield, CT residents to the Katonah train station. The Sustainable Bedford Coalition will also explore interest levels among residents for this type of service by conducting surveys.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

145 buses

Annual Reductions

CO_2e: 127 tonnes
Diesel: 13,340 gal
$: $33,350
NOx: 478 lbs
SOx: 66 lbs
CO: 609 lbs
VOCs: 196 lbs
PM10: 65 lbs

Limit Idling of Local Transit Buses and School Buses

The Sustainable Bedford Coalition will partner with Westchester County for the BeeLine system and the Bedford Central and Katonah Lewisboro school districts to launch an education campaign on the public health risks of idling. The campaign will support town-wide written material as well as anti-idling signs placed in common idling areas. It will also adopt a ticketing program for those that violate the County s three minute anti-idling law.

Community Transportation Measures

Increase Bus Ridership + Regional Transportation Study to Determine Communting Patterns

The Sustainable Bedford Coalition s Transportation Task Force will initiate a study to determine commuting patterns and the feasability of starting a commuter bus system linking the hamlets/Park and Rides to the the Metro North train stations in our area. This study will also require a survey to all households in the town to best determine probable use and interest.

Cost: N/A
Payback: 0 years
Co-Benefits:

Scope

608 additional daily passengers riding the bus / avoided car trips to station

Annual Reductions

CO_2e: 69 tonnes
Gasoline: 22,530 gallons
Diesel: - 15,016 gallons
$: $65,111 or $107 per student (at $2.89/gal)
NOx: -471 lbs
SOx: -70 lbs
CO: 14,546 lbs
VOCs: 1,376 lbs
PM10: -41 lbs

Electric Vehicle Charging Stations on Parking Structures and Other Locations

Electric vehicle (EVs) drive trains are much more efficient than the drive trains used on standard internal combustion engine vehicles. Electric motors, rather than pistons and shafts, provide necessary propulsion. EVs use regenerative braking to capture and reuse the energy of the vehicle s momentum in stop-and-go traffic, greatly increasing their efficiency in city driving. One way to encourage EV use is to provide charging stations in strategic locations in the community, including parking spaces that are reserved for EVs and have a charging connection.

The availability of EV charging stations promotes the idea of switching to EVs. EV charging stations must be present before consumers purchase EVs.

Cost: $200,000 (Approx. $4,000 per station)
Payback: N/A
Co-Benefits:

Scope

50 Charging Stations

Annual Reductions

CO_2e: 50 tonnes
Gasoline: 9,408 gallons
Energy: - 104,429 kWh
$: $8,373
NOx: -76 lbs
SOx: -436 lbs
CO: 6,251 lbs
VOCs: 655 lbs
PM10: -82 lbs

Cost: $18,250
Payback: 2.2 years
Co-Benefits:

Scope

73 bicycles available

Annual Reductions

CO_2e: 38 tonnes
Vehicle Miles: 79,935 mi
Gasoline: 4,058 gal
$: $8,115
NOx: 12 lbs
SOx: 1 lb
CO: 2,743 lbs
VOCs: 288 lbs
PM10: 6 lbs

Provide Bicycles for Daily Trips

Many U.S. cities have adopted a bicycle-sharing program with easy docking stations around town. Some programs take repaired donated bikes and simply place them on the sidewalk for use, usually painted a particular color for identification. Other programs have bike stands at transit stations and areas with high pedestrian traffic, where bikes are unlocked with a coin deposit or magnetic card.

The Sustainable Bedford Coalition, working with The Bedford Bike Advisory Group, will explore the feasibility of such a bike sharing program for Bedford and will consider a partnership with a private organization that already runs economically successful programs in similar towns.

The deposit is returned when the bike is brought to any station.

Cost: $0
Payback: 0 years
Co-Benefits:

Scope

200 students walking or biking each day to school

Annual Reductions

CO_2e: 55 tonnes
Vehicle Miles: 115,200 mi
Gasoline: 5,848 gal
$: $17,543
NOx: 17 lbs
SOx: 1 lb
CO: 3,953 lbs
VOCs: 415 lbs
PM10: 9 lbs

Safe Routes to School

The Sustainable Bedford Coalition will partner with local community schools to develop an ongoing education for child safety in traffic throughout the community and neighboring communities that use our roads as traffic routes. They will launch an education program on the health benefits to children for walking to school, expand the pedestrian friendly zones and sidewalks where the Safe Routes to School program is used, and promote special Walk to School days.

Community Transportation Measures

Retrofit School Buses with Oxydation Catalysts

The town will work with the Katonah-Lewisboro and Bedford Central School Districts to retrofit school buses with oxidation catalysts and emission controls. This will promote measurable ghg emission reductions and significantly improve the air quality around the school bus areas where children congregate to board or depart the buses.

Cost: $145,000 (1,000 per bus, assumes 85% - 90% paid by available funding)
Payback: N/A
Co-Benefits:

Scope

145 School Buses

Annual Reductions

CO: 11,315 lbs
VOCs: 3,652 lbs
PM10: 405 lbs

School Bus Emissions Controls Particulate Trap

Diesel particulates are carcinogenic and may contribute to asthma. Because school buses operate in close proximity to children, whose lungs are the most vulnerable, it is important to control emissions from them. Particulate filters remove soot and unhealthy matter from the air.

The Sustainable Bedford Coalition will work with the Katonah-Lewisboro and Bedford Central School Districts to explore the feasibility of adding particulate filters to all district school buses.

Cost: Cost: $145,000 (1,000 per bus, assumes 85% - 90% paid by available funding)
Payback: N/A
Co-Benefits:

Scope

145 Buses

Annual Reductions

NOx: 247 lbs
CO: 11,315 lbs
VOCs: 3,652 lbs
PM10: 1,216 lbs

d. Waste + Recycling

(20.9% of total proposed GHG reductions)

Greenhouse gas emissions from the waste sector come from both direct and indirect sources. Direct emissions can be easily attributed to the breakdown of waste buried in landfills, producing methane, while indirect emissions are a result of the energy needed to produce the materials we consume.

There is currently no organized town wide trash collection in the Town of Bedford. Bedford residents contract directly with the carter of their choice and each picks up and hauls waste to various landfills or other disposal centers. The haulers have no reporting requirements to the town, making accurate data collection difficult.

According to our Emissions Inventory, the Waste Sector contributes 5% of The Town of Bedford s annual greenhouse gas emissions. In gathering data for Bedford, we considered only waste that was generated within our town borders. Direct emissions are not reflected because Bedford does not have a landfill. However, the consumption habits and disposal methods of the residents of Bedford are contributing to greenhouse gas emissions that would be counted in the inventory of the city in which the landfill is located.

While we may not measure a high percentage of emissions form the Waste Sector in our town, we have a responsibility to examine our existing waste generation and disposal and reduce emissions wherever they are measured.

The actions outlined in this section focus on reducing emissions through reducing waste and increasing recycling and composting in both homes and businesses.

total GHG reduction in sector: **40,591 Tonnes CO_2e**

co-benefits:

Municipal Waste + Recycling Measures

Zero Waste Goal for Public Events

Zero Waste is a strategy that considers the life cycle of all products (where did they come from and where do they end up after we are done with them). This strategy reduces cost, promotes health, and encourages effiency as waste is essentially inefficiency. The Town of Bedford has created a goal for all Town sanctoned public events to be zero waste. This means that non biodegradable or recyclable plastics should not be purchased and that all food and all waste should be, compostable recyclable or reusable. This will divert our waste from the landfill therby reducing the global green house gasses associated with the manufacturing and transportation of products and the production of methane from the landfill.

Cost: N/A
Payback: N/A
Co-Benefits:

Recyclable Procurement Policy Requiring Purchase of Recyclable Materials

The Town of Bedford will create a standard for the purchase of products. They will vet items through a sustainability lens before purchase, looking at the life cycle of each product, (where was it made, where does it go after its usefullness). This will enable the town to reduce the use of products that are created with high energy content, with no recycling potential and decrease the Town s overall Ecological Footprint, as well as save money.

Cost: N/A
Payback: N/A
Co-Benefits:

Low-VOC Procurement Policy for Cleaning Products and Paint

Many cleaning products release volatile organic compounds (VOC s)that are harmful to health in indoor environments, and contribute to regional air pollution. These VOC s contribute to ozone formations. The Town of Bedford will require LOW or NO VOC Cleaning Products in Town facilities to promote the health of the people using them, the empolyees in the environment and to reduce air pollution in the region.

Paints are a significant source of both indoor and outdoor air pollution. Oil-based and glossy paints and varnishes use VOCs as solvents, which evaporate into the air as the paint dries. Indoors, these VOCs can cause a variety of health problems, while outdoors they contribute to the formation of smog. Emissions can continue for up to six months after painting.

Cost: $500
Co-Benefits:

Scope
All municipal buildings

Annual Reductions
VOCs: 100 lbs

Community Waste + Recycling Measures

Cost: $50,000 ($100 per business)
Payback: < 1year
Co-Benefits:

Scope

500 participating businesses

Annual Reductions

CO_2e: 2,816 tonnes
Energy: 4,842,500 kWh, 180,500 therms
$: $690,020
NOx: 7,851 lbs
SOx: 20,440 lbs
CO: 5,828 lbs
VOCs: 733 lbs
PM10: 4,543 lbs

Green Business Programs

Green business programs are voluntary programs to encourage businesses to go beyond operations regulations and to conduct business in an environmental friendly manner. Businesses receive a checklist of measures, and implement a certain number of them to be certified. The incentive for businesses to participate is good publicity resulting from their efforts, the ability to advertise as a certified green business and lower business costs.

Green Businesses can help reduce Green House Gasses in all sectors: energy consumption, transportation and waste. The Town of Bedford will encourage businesses to voluntarily conduct business in an environentally friendly manner and will receive support from the Sustainable Bedford Coalition.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

503 lbs per person/yr of waste diverted from landfills

Annual Reductions

CO_2e: 14,499 tonnes
Energy: 20,728,970 kWh
NOx: 62,042 lbs
SOx: 27,549 lbs
CO: 1,182 lbs
VOCs: 62 lbs
PM10: 166 lbs

Establish/Expand Curbside Recycling Programs & Increase Plastic Recycling Eligability

Curbside recycling is an efficient way for residents to recyle as much as 85% of their home garbage. The Town of Bedford, in cooperation with The Sustainable Bedford Coailition, will work with our town carters to require the collection of additional items, such as: junk mail, cardboard, bottles and cans and all plastics 1-7. This would eliminate a significant amount of green house gasses from going to the landfill and promote a more conscious consumer.

Community Waste + Recycling Measures

Implement Pay-as-You-Throw Program

Pay-as-you-throw programs provide a financial incentive for people to reduce the amount of waste they generate. Pay-as-you-throw programs encourage recycling, reuse of items, and source reduction, where people may choose items with less packaging knowing they will have to pay for the disposal of that packaging. In addition, the program would encourage home composting of food and yard waste. This is a fair way to charge for garbage disposal services, as people wiill pay in proportion to the amount of waste they generate. This program will decrease Bedford s indirect GHG emissions significantly. Potentially only 15% of residential waste would be carted to the landfill decreasing the methane produced in the landfill, thereby curtailing our global greenhouse emissions.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

300 lbs per person/yr of waste reduced

Annual Reductions

CO_2e: 8,263 tonnes
Energy: 11,912,999 kWh
NOx: 35,656 lbs
SOx: 15,832 lbs
CO: 679 lbs
VOCs: 36 lbs
PM10: 95 lbs

Reuse Facilities/Programs

Reuse Faciities are available in Westchester County. The energy benefit for Bedford in reusing products would be in diverting the GHG from the mining and transportation of raw materials to the factories and wastes created from the generation and transportation of new products. Sustinable Bedford Coalition will look to establish a local Reuse Facility to encourage the exchange of materials and products between residents and divert material from the waste stream.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

100 lbs per person/yr of waste prevented

Annual Reductions

CO_2e: 6,652 tonnes
Energy: 11,531,520 kWh
NOx: 34,514 lbs
SOx: 15,325 lbs
CO: 657 lbs
VOCs: 35 lbs
PM10: 92 lbs

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

100 lbs per person/yr of waste diverted from landfill

Annual Reductions

CO_2e: 3,156 tonnes
Energy: 4,599,832 kWh
NOx: 13,767 lbs
SOx: 6,113 lbs
CO: 262 lbs
VOCs: 14 lbs
PM10: 37 lbs

Establish/Expand Business Recycling Programs

The Town of Bedford suggests that our carters be required to collect junk mail, cardboard, bottles and cans, metals and all plastics 1-7. This would decrease our GHG emissions by diverting waste to the landfill, and encouraging a more conscientous business owner.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

804 lbs per person/yr of waste diverted from landfill

Annual Reductions

CO_2e: 4,052 tonnes
Energy: N/A

Organics Composting

When organic matter like wood, paper, food, and yard waste is placed in landfills it decomposes anaerobically producing methane. Methane is a greenhouse gas 21 times as powerful as carbon dioxide. About 12% of municipal solid waste is food scraps, and another 12% is yard waste. Collecting and composting organic waste prevents emissions that would have been produced in a landfill.

The Sustainable Bedford Coalition will promote organics composting, in order to capitalize on GHG reductions associated with diverting waste from the landfill. The establishment of a composting facility either within the Town of Bedford or as a participant in The Northern Westchester Energy Action Coalition effort for a regional facility is key to reducing organics in landfills. Residents would be able to deliver organic waste materials to a chosen site and be provided with compost for lawns and gardens.

Community Waste + Recycling Measures

Yard Waste Composting

Organic matter like wood and yard waste decomposes extremely slowly in a landfill and when it does decompose, it manufactures methane gas. Methane is a Greeen House Gas 21 times more potent than carbon dioxide. Sustainable Bedford Coalition will work to establish an expanded a yard waste composting program that encourages home yard waste composting. The organic matter would naturally biodegrade, and reduce transportation emissions and excessive methane production from a landfill.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

300 lbs per person/yr of waste diverted from landfill

Annual Reductions

CO_2e: 1,153 tonnes
Energy: N/A

Reuse or Recycling of Construction Materials

In the event of a remodel, or tear down, most materials are demolished and sent to the landfill. The wood, hardware, windows, kitchens cabinets, sinks that are traditionally discarded could be reused. There are many reclaim and reuse (deconstruction) companies that will take what would typically be discarded and find another use elsewhere. The energy benefit for Bedford in reusing products would be in diverting the GHG from the mining and transportation of raw materials to factories and wastes created from the generation and transportation of new products as well as reducing emissions from the landfill. The Sustainable Bedford Coalition will work with partners to develop best practices to educate and encourage each construction site to reuse and recycle its constuction debris.

Cost: N/A
Payback: N/A
Co-Benefits:

Conduct a Community Waste Audit

The Sustainable Bedford Coalition will initiate a community waste audit to identify the components of our waste stream and assess what is really going into area landfills. This information will help to make informed decisions about how to allocate resources and target education toward source reduction, recycling and composting.

Cost: N/A
Payback: N/A
Co-Benefits:

Cost: N/A
Payback: N/A
Co-Benefits:

Zero Waste Goal for Public Events

Zero Waste is a strategy that considers the life cycle of all products (where did they come from and where do they end up after we are done with them). This strategy reduces cost, promotes health, and encourages effiency as waste is, essentially, inefficiency. The Town Sustainable Bedford Coalition has created a goal for all public events to be zero waste. This means that Non biodegradable or recyclable plastics should not be purchased and that all food and all waste should be, compostable recyclable or reusable. This will divert our waste from the landfill thereby reducing the global green house gasses associated with the manufacturing and transportation of products and the production of methane from the landfill.

Cost: N/A
Payback: N/A
Co-Benefits:

Plastic & Paper Bag Fee/ Reusable Bag Distribution Program

The Town of Bedford stands to reduce global green house gasses associated with paper production (a high energy and water polluting process) and with plastics production, (a petroleum based high energy process). The Town of Bedford will initiate one of two options-- either an outright ban or a fee on both plastic bags and paper bags in stores that have greater than 5000 sq feet of space. A fee would fund a reusable bag distribution to Bedford Town Residents though the implementation of such a fee would probably require a Home Rule Exemption from the State of New York. A ban would not. The Pace Environmental Law Clinic has offered to study both options for the Town and help recommend sound and legally defensible policy.

Cost: N/A
Payback: N/A
Co-Benefits:

#6 Plastic Ban

The Town of Bedford proposes to BAN all Polystyrene in products designed as disposable or single use. This product material is not currently recyclable and has many toxins associated with it. There are many many products to substitute for styrofoam and polystyrene that have life cycle s that either are recyclable or are biodegradable at the end of their usefulness. This will reduce Bedford s overall global green house gas emissions and contribute to better health of its residents.

Community Waste + Recycling Measures

Tap Water Campaign

The Town of Bedford will launch a campaign to create a new culture of tap water drinkers. The elimination of plastic water bottles is important. Plastic bottles are created with petroleum, and require more water to produce than the bottle ultimately holds. The water used in the production of water bottles is ineffiecient and wasteful and the production requires tremendous energy. Bottled water is not regulated. Bedford s Town water is closely monitored and most private well sources are clean. The eventual elimination of bottled water will significantly deminish the Town's Greenhouse Gas Emissions.

Cost: N/A
Payback: N/A
Co-Benefits:

Bedford Waste Carting Study with Evaluation of Permitting and Reporting Requirements

The Town of Bedford uses independent carters to haul waste to landfills in our region. This leads to an inneficient collection system as many different carters may take the same route on the same day to collect residential and commercial waste adding to our transportation emissions and creating basic inefficency. The Town proposes to implement a comprehensive waste study to include a calculation of what tonnage each carter currently hauls, what the waste is comprised of and where the carters ultimately dispose of their waste. The Town will study what recyclables should be added by carters, expanding curbside recycling, making it easier for residents to recycle junk mail, cardboard and plastics 1-7. Currently, most carters only accept plastics # 1 and 2. This study will show us how much we might be able to reduce the Town s ecological footprint and save Green House Gas emissions.

Cost: N/A
Payback: N/A
Co-Benefits:

e. Land + Water Use

(1.2% of total proposed GHG reductions)

Land use planning includes strategies for preserving the natural environment, conserving water, and minimizing the use of automobiles so that we can reduce greenhouse gas emissions and better enjoy the beauty and luxury of our natural resources.

In the Town of Bedford, these strategies have long been a priority and are specifically addressed in the Bedford Comprehensive Plan. Assembled by a 16 member volunteer planning committee working with the town s Director of Planning, and adopted by the Bedford Town Board in 2002, the Comprehensive Plan provides a framework for development and preservation, and contains the goals, objectives, and strategies for the future development and conservation of our community. The land use planning principles guiding the Comprehensive Plan include Open Space and Natural Environment, Residential Development, Business Development, Community Services and Facilities, Transportation and Community Appearance and Historic Preservation.

The Measures contained within this sector of the Climate Action Plan focus on water conservation, transit oriented development, and landscape alternatives. These measures support, enhance and complement the goals and recommendations in the Bedford Comprehensive Plan.

To view the Bedford Comprehensive Plan, please visit www.bedfordny.info

total GHG reduction in sector: **2,313 Tonnes CO_2e**

co-benefits:

Municipal Land + Water Use Measures

Water Conservation (3 Measures)

The Town of Bedford will evaluate and look to improve water conservation measures in its buildings and operations. These measures may include: use of gray water, low flow fixtures, modifying water use behaviors, using xeriscaping (landscape with little need for water) and rain barrels.

Total Cost: $22,817
Co-Benefits:

Total Annual Reductions

CO_2e: 2 tonnes
Energy (annually): 287,210 kWh
Water (annually): 13,450 gal.
$: $1,433
NOx: 5 lbs
SOx: 8 lbs
CO: 3 lbs
VOCs: 0 lbs
PM10: 1 lbs

1. Water Saving Shower Heads

Federal regulations require showerheads to have a flow rate of less than 2.5 gallons per minute (gpm), but prior to 1992, some showerheads had flow rates of 5.5 gpm. Using low flow shower heads will save significant amounts of energy and water resources. The Town of Bedford will look to replace older shower heads in all buildings.

Cost: $145 ($29 per showerhead)
Payback: < 1 year

Scope

5 Showerheads replaced

Annual Reductions

CO_2e: 1 tonne
Energy: 252 kWh
83 e/ therms
Water: 13,450 gallons
$: $170

2. High Efficiency Toilets

Toilet flushing can account for one third of water use in commercial and office buildings. New High Efficiency Toilets with the WaterSense label use 1.3 gallons per flush or less, compared to the current federal standard of 1.6 gallons per flush. Old toilets may use 3.5 or 5 gallons or more per flush. High Efficiency Urinals use 0.5 gallons per flush or less compared to the current federal standard of 1.0 gallons per flush. Old urinals may use 2-3 gallons or more per flush

Cost: $22,400 ($448 per toilet)
Payback: 19.5 years

Scope

50 toilets replaced

Annual Reductions

CO_2e: 1 tonne
Energy: 1,549 kWh
Water: 286,786 gallons
$: $1,147

3. Water Saving Faucets

Cost: $272 ($8 per faucet)
Payback: 2.2 years

Scope
34 faucets replaced

Annual Reductions
CO_2e: 0 tonnes
Energy: 172 kWh
57 e/therms
Water: 9,180 gallons
$: $116

The aerator the screw-on tip of the faucet ultimately determines the maximum flow rate of a faucet. Typically, new kitchen faucets come equipped with aerators that restrict flow rates to 2.2 gpm, while new bathroom faucets have ones that restrict flow rates from 1.5 to 0.5 gpm.

Aerators are inexpensive to replace and they can be one of the most cost-effective water conservation measures. For maximum water efficiency, purchase aerators that have flow rates of no more than 1.0 gpm. Some aerators even come with shut-off valves that allow you to stop the flow of water without affecting the temperature. When replacing an aerator, bring the one you re replacing to the store with you to ensure a proper fit.

The Town of Bedford will examine all faucets within the town buildings and look to replace older aerators with ones that allow no more than 1gpm flow.

Plant Trees to Shade Buildings

Cost: $4,480 ($224 per tree)
Payback: 11 years
Co-Benefits:

Scope
20 trees planted

Annual Reductions
CO_2e: 2 tonnes
Energy: 4,080 kWh
$: $408
NOx: 4 lbs
SOx: 17 lbs
CO: 4 lbs
VOCs: 0 lbs
PM10: 4 lbs

This measure considers the effect trees can have in reducing energy required to heat and cool buildings. Trees properly planted with energy savings in mind can reduce the amount of energy (electricity, natural gas, or other fuel) used to cool and heat buildings. This not only reduces associated emissions, but also saves money. The shade from a single well-placed mature tree reduces annual air conditioning use two to eight percent (in the range of 40-300 kWh), and peak cooling demand two to ten percent (as much as 0.15-0.5 kW).

The Town of Bedford will work with the its Tree Advisory Board and local garden clubs to develop best practices to encourage tree planting for shading buildings.

Municipal Land + Water Use Measures

Low-Maintenance Landscaping

Well-groomed green lawns are aesthetically pleasing, but they come with a number of environmental costs. Landscaping using local native plants can grealy reduce or eliminate the need for irrigation, pesticides, and gasoline powered maintenance equipment.

The Sustainable Bedford Coalition will work with local garden clubs and other experts to develop best practices for Town administrators to encourage low maintenance landscaping in our town owned lands.

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

21 Acres of low maintenance landscaping

Annual Reductions

CO_2e: 2 tonnes
Energy: 0 kWh
Gasoline: 168 gallons
NOx: 1 lbs
SOx: 0 lbs
CO: 114 lbs
VOCs: 813 lbs
PM10: 0 lbs

Non-Asphalt Pavements

Paving alternatives can reduce the urban heat island effect, reducing energy use for cooling. Asphalt is made with petroleum products and can release large amounts of volatile organic compounds (VOCs), a primary component of smog, into the air while curing. In the Chicago metropolitan area, for example, asphalt paving emitted 13 tons of VOCs into the air each day during the summer peak smog season. One option for reducing emissions is to use asphalt with reduced VOC content. Many areas already prohibit the use of the high-VOC cutback asphalt, which uses petroleum-based thinner, during times when smog is a problem.

The Sustainable Bedford Coalition will work with local resources and the Town of Bedford to develop best practices to encourage the use of Non-Asphalt Pavements on our town roads and parking lots.

Cost: N/A
Payback: N/A
Co-Benefits:

Community Land + Water Use Measures

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

100 residential units in Transit Oriented Development

Annual Reductions

CO_2e: 588 tonnes
Vehicle Miles: 1,230,660 mi
$: $124,940
Gas Saved: 62,470 gal
NOx: 187 lbs
SOx: 12 lbs
CO: 42,231 lbs
VOCs: 4,429 lbs
PM10: 91 lbs

Transit Oriented Development

High density neighborhoods with good rail or bus transit, mixed residential and commercial uses, and pedestrian-friendly design have much lower rates of car use than typical low-density suburban developments. Transit oriented design (TOD) attempts to create such neighborhoods in planning of new or existing transit systems.

The Town of Bedford will identify Transit Oriented Development opportunities that direct growth to within walking distance of mass transit in the case of Bedford, to the Metro North train stations located in Katonah and Bedford Hills. TOD can also be developed around county bus lines, park-and-ride facilities and bike and pedestrian infrastructure located near the train that will encourage people to walk or bike to transit rather than driving.

Cost: N/A
Payback: N/A
Co-Benefits:

Build Storm Water Capacity through Municipal Codes and Regulations

The Town of Bedford will explore the enhancement of municipal codes and regulations that conserve water, including:, review building storm water retention requirements and vegetation requirements, and revising codes to encourage organic land management practices.

Cost: N/A
Payback: N/A
Co-Benefits:

Modified Town Water Billing System

While the majority of Bedford residents rely on private wells for their water, four Water Districts within the Town serve 2,340 households through public water supply systems. Water bills are rendered quarterly and fees are based on meter reading.

This measure recommends examining the existing rate structure and implementing a granular sliding fee for water usage so that fees per unit of increased consumption increase with the amount of water consumed.

Community Land + Water Use Measures

Water Conservation (5 Measures)

The Sustainable Bedford Coalition will evaluate and promote various water conservation measures among the residents and the landscaping industry. These measures may include: use of gray water, low flow fixtures, modifying water use behaviors, using xeriscaping (landscape with little need for water) and rain barrels.

Total Cost: $2,283,226

Co-Benefits:

Total Annual Reductions

CO_2e: 1,229 tonnes
Energy: 1,229,354 kWh
Water: 74,347,500 gal.
$: $418,241
NOx: 3,533 lbs
SOx: 5,250 lbs
CO: 1877 lbs
VOCs: 272 lbs
PM10: 1201 lbs

1. Water Saving Shower Heads

Federal regulations require showerheads to have a flow rate of less than 2.5 gallons per minute (gpm), but prior to 1992, some showerheads had flow rates of 5.5 gpm. Using low flow shower heads save significant amounts of energy and water resources. Therefore, if you have fixtures that pre-date 1992, you might want to replace them and save money on energy used for less pumping or if you belong to the Water District, save on billing costs. You can purchase some quality, low-flow fixtures for around $10 to $20 a piece and achieve water savings of 25%–60%

Total Cost: $183,802 ($29 per showerhead)
Payback: < 1 year

Scope

6,638 showerheads replaced

Annual Reductions

CO_2e: 756 tonnes
Energy: 500,153 kWh
101,670 e/therms
Water: 17,856,220 gallons
$: $233,058

2. Efficient Clothes Washers

Clothes washers are the second biggest water user in most homes (after toilets). High efficiency washers save water, energy, and detergent. Energy savings derive from reduced use of hot water and reduced water pumping costs. Efficienct washers are also gentler on clothes, increasing their durability.

Total Cost: $78,000 ($150 incremental cost)
Payback: 11 years

Scope

5,200 clothes washers replaced

Annual Reductions

CO_2e: 284 tonnes
Energy: 536,733 kWh
Water: 36,176,400 gallons
$: $70,787

3. Water Saving Faucets

Total Cost: $108,464 ($8 per faucet)
Payback: 2.1 years

Scope
13,558 faucets replaced

Annual Reductions
CO_2e: 155 tonnes
Energy: 102,535 kWh
20,843 e/therms
Water: 3,660,660 gallons
$: $47,779

The aerator the screw-on tip of the faucet ultimately determines the maximum flow rate of a faucet. Typically, new kitchen faucets come equipped with aerators that restrict flow rates to 2.2 gpm, while new bathroom faucets have ones that restrict flow rates from 1.5 to 0.5 gpm.

Aerators are inexpensive to replace and they can be one of the most cost-effective water conservation measures. For maximum water efficiency, purchase aerators that have flow rates of no more than 1.0 gpm. Some aerators even come with shut-off valves that allow you to stop the flow of water without affecting the temperature. When replacing an aerator, bring the one you re replacing to the store with you to ensure a proper fit.

4. High Efficiency Toilets

Total Cost: $1,912,960 ($448 per toilet)
Payback: 28.7 years

Scope
4,270 toilets replaced

Annual Reductions
CO_2e: 34 tonnes
Energy: 89,933 kWh
Water: 16,654,220 gallons
$: $66,617

Toilet flushing can account for one third of water use in commercial and office building and usually a top user in the home. New High Efficiency Toilets with the WaterSense label use 1.3 gallons per flush or less, compared to the current federal standard of 1.6 gallons per flush. Old toilets may use 3.5 or 5 gallons or more per flush. High Efficiency Urinals use 0.5 gallons per flush or less compared to the current federal standard of 1.0 gallons per flush. Old urinals may use 2-3 gallons or more per flushensure a proper fit.

5. Promote Education, Information and Training on Water Conservation and Re-Use Systems

The Sustainable Bedford Coalition will provide education, information and training on various water conservation and re-use methods, through a series of workshops targeted at residents and landscapers. Topics will include: use of rain water collection systems such as Rain Barrels, use of drought resistant grasses and native plantings, rain gardens, green roofs and organic landscape maintenance.

Community Land + Water Use Measures

Increase Urban Forest

Trees remove CO2 from the atmosphere, use the carbon to form the physical structure of the tree (roots, trunk, branches and leaves), and return the oxygen to the atmosphere. A single mature tree can absorb as much as 48 lbs of CO2 per year. It is estimated that between 660 and 990 million tons of carbon is stored in our urban forests nationally. By maintaining a healthy urban forest, prolonging the life of trees, and continually increasing tree stock, communities can increase their net carbon storage over the long term.

The Sustainable Bedford Coalition will work with the Town of Bedford s Tree Advisory Board to develop measures to fund nonprofit tree planting and education efforts, increase maintenance funding, and require planting of large trees.

Cost: $112,000 ($224 per tree)
Payback: 320 years
Co-Benefits:

Scope

500 trees

Annual Reductions

CO_2e: 126 tonnes
Energy: 3,500 kWh
$: $350
NOx: 3 lbs
SOx: 15 lbs
CO: 4 lbs
VOCs: 3 lbs
PM10: 0 lbs

Plant Trees to Shade Buildings

This measure considers the effect trees can have in reducing energy required to heat and cool buildings. Trees properly planted with energy savings in mind can reduce the amount of energy (electricity, natural gas, or other fuel) used to cool and heat buildings. This not only reduces associated emissions, but also saves money. The shade from a single well-placed mature tree reduces annual air conditioning use two to eight percent (in the range of 40-300 kWh), and peak cooling demand two to ten percent (as much as 0.15-0.5 kW).

The Sustainable Bedford Coalition will work with the The Town of Bedford s Tree Advisory Board and local garden clubs to develop best practices to encourage tree planting for shading buildings.

Cost: $112,000 ($224 per tree)
Payback: 11 years
Co-Benefits:

Scope

500 trees

Annual Reductions

CO_2e: 38 tonnes
Energy: 102,000 kWh
$: $10,200
NOx: 101 lbs
SOx: 428 lbs
CO: 106 lbs
VOCs: 12 lbs
PM10: 94 lbs

Community Land + Water Use Measures

Cost: N/A
Payback: N/A
Co-Benefits:

Scope

6,500 Acres of low maintenance landscaping

Annual Reductions

CO_2e: 326 tonnes
Energy: 219,375 kWh
Water: 87,750,000 gal
Gasoline: 26,000 gal
NOx: 296 lbs
SOx: 926 lbs
CO: 17,805 lbs
VOCs: 125,369 lbs
PM10: 239 lbs

Low-Maintenance Landscaping

Well-groomed green lawns are aesthetically pleasing, but they come with a number of environmental costs. Landscaping using local native plants can grealy reduce or eliminate the need for irrigation, pesticides, and gasoline powered maintenance equipment.

The Sustainable Bedford Coalition will work with local garden clubs and other experts to develop best practices to encourage low maintenance landscaping in our community.

Cost: 15,000 ($60 per lawnmower)
Payback: N/A
Co-Benefits:

Scope

250 lawnmowers replaced

Annual Reductions

CO_2e: N/A
VOCs: 4,750 lbs

Gasoline Lawnmower Replacement

While the amount of fuel used by gasoline lawnmowers and yard equipment is small compared to the quantity used by automobiles, they pollute disproportionately--one mower can produce as much pollution as 43 cars. Overall, gasoline yard equipment can cause about 5% of local air pollution. Replacing these gasoline-powered tools with electric or human-powered ones can reduce emissions significantly.

The Sustainable Bedford Coalition will work with local garden clubs and other experts to develop best practices to encourage low maintenance landscaping in our community and the use of low or no emission maintenance equipment.

Non-Asphalt Pavements

Cost: N/A
Payback: N/A
Co-Benefits:

Paving alternatives can reduce the urban heat island effect, reducing energy use for cooling. Asphalt is made with petroleum products and can release large amounts of volatile organic compounds (VOCs), a primary component of smog, into the air while curing. In the Chicago metropolitan area, for example, asphalt paving emitted 13 tons of VOCs into the air each day during the summer peak smog season. One option for reducing emissions is to use asphalt with reduced VOC content. Many areas already prohibit the use of the high-VOC cutback asphalt, which uses petroleum-based thinner, during times when smog is a problem.

The Sustainable Bedford Coalition will work with local resources to develop best practices to encourage the use of Non-Asphalt Pavements in our community.

IV. Implementation

Achieving meaningful reductions of greenhouse gas emissions and addressing the threats to our environment requires significant effort at the local grassroots level. The Town of Bedford, New York is perfectly situated as a successful showcase for the creation of a sustainable community.

In April 2007 the Town of Bedford took a formal stance against climate change with the appointment of the Bedford Energy Advisory Panel and the resolution committing our town to a twenty percent reduction of community wide emissions by the year 2020. These actions set the town on a course toward a sustainable way of life. Since then we have successfully engaged the community, completed a greenhouse gas emissions inventory and written a climate action plan, all readying us for the implementation phase.

Implementation will be carried out on a municipal level by the local government and a community level with the leadership of the Sustainable Bedford Coalition.

a. Sustainable Bedford Coalition

As we move towards a more sustainable town, Bedford will be forming a new entity in charge of carrying out the recommendations set forth by the Bedford Energy Advisory Panel in this Climate Action Plan. Sustainable Bedford Coalition will represent a groundbreaking partnership between local government, residents, businesses, schools, civic and religious groups, and non-profit groups wishing to involve themselves directly in Bedford's sustainable future. It will be structured to include a board of directors, a paid administrative staff and a coalition of 10 task force groups.

SUSTAINABLE BEDFORD COALITION

Sustainable Bedford Coalition s 10 task force groups (energy, transportation, land use, waste/recycling, water, food/agriculture, schools, businesses, civic and religious entities and residents) will be responsible for assessing the priorities of our community and implementing the reduction measures that combine the most significant GHG reducing potential, the biggest cost savings and the most health benefits and correspondingly gain the most support of our community.

The coalition will promote community engagement in a number of ways. It will launch and maintain a website allowing for community members to learn about the issues, follow the Coalition s progress, and take action individually or as part of the coalition. There will also be significant outreach ef-

forts in addition to educational and promotional events, in order to galvanize support for for the proposed measures and to develop greater awareness within our community that will result in changed behavior toward a common goal.

b. Measuring our Progress

To ensure effective implementation, our progress will be closely monitored by the Town of Bedford and the Sustainable Bedford Coalition. We will be completing periodic updates to our GHG emissions inventory in addition to occasionally surveying the town businesses and residents for observed behavior changes and input. This influx of data will allow us to track our progress, adjust our measures as needed and set new goals for the future. Progress reports will be made available to the public through both the town s and Sustainable Bedford Coalition s websites.

c. Implementation Timeframe Table

We have organized the Climate Action Plan measures into a simplified table below. Each has been considered within a 10 year implementation timeframe, beginning immediately and ending with our goal at the end of 2020. Measures have been grouped into short, medium and long term projects. Short term, refers to measures targeted for implementation between now and 2012, medium: from 2012 until 2015, and long: 2015 until the end of 2020. These qualifiers refer to the amount of time it will take to galvanize support and start the implementation process, however as we move forward and circumstances change, there may be a shift in timeframe. Progress will be reviewed regularly by the Town of Bedford and the Sustainable Bedford Coalition. Some of these measures will be completed with a single action while others will require ongoing support in order for maximum success.

Energy

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Offer Loans for Energy Efficiency Improvements in Residential Buildings	46,257	Community	X	X	X

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Commence Study Around Community Scale Renewable Energy	51,753	Community	X		
	803	Municipal	X		
Energy Efficiency Retrofits of Existing Facilities	7702	Community		X	X
	177	Municipal	X		
Require Home Energy Rating (HERs) at Time of Sale	7236	Community	X		
Energy Efficiency Education Targeted at Business	3,965	Community	X		
Promote Existing Home Weatherization Programs to Low Income Households and Seniors	1,206	Community	X		
Bedford Residential Building-Energy Code	1,628	Community	X		
Bedford Commercial Building Energy Code/Municipal Green Building Policy	124	Community	X		
		Municipal	X		
ENERGY EFFICIENT/ENERGY STAR APPLIANCES	4,650.50	Community	X	X	X
	28.2	Municipal	X	X	X
HEATING AND COOLING	3,821	Community	X	X	X
	13	Municipal	X	X	X
Compact Flourescent Light Bulb (CFL) Distribution	16	Community	X		
Efficient Lighting Retrofits	1,184	Community		X	
	12	Municipal		X	

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Lighting Occupancy Sensors	1973	Community	X		
	35	Municipal	X		
LED Holiday Lights	5.6	Community	X		
Solar Photovoltaic (PV) Energy	746	Community	X	X	X
	19.5	Municipal	X		
Solar Hot Water	454	Community	X	X	
		Municipal	X	X	
Switch Electric Heat to Natural Gas	1889	Community		X	X
Energy Efficient Affordable Housing	29	Community		X	X
Residential Construction Fee-bate Program	n/a	Community		X	
Modified Town Water Billing System	n/a	Community	X		
Accellerate Permitting Pro-cess for Green Buildings	n/a	Community	X		
Smart Meters	n/a	Community		X	
Ordinance Review for Renew-able Energy Installation	n/a	Community	X		

Municipal Energy Efficiency Purchasing Policy	n/a	Municipal	X		

Transportation

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Use Smaller Fleet Vehicles	4,738	Community	X	X	
	9	Municipal	X	X	
Integrate Bicycles and Transit	4,036	Community	X	X	
			X	X	
Promote Carpooling and Van-pooling	2,241	Community	X		
	1 tonne	Municipal	X		
Education on Low-carbon Transportation Options	1100	Community	X		
Hybrid Vehicles + Education/ Health and Emissions	1,031	Community	X	X	
	49	Municipal	X	X	
Create bicycle friendly zones	835	Community		X	
Create pedestrian friendly zones and increase hamlet sidewalks	6	Community		X	
Fleet Conversion to Biodiesel (B20)	300	Community	X		
	46	Municipal	X		

` Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Anti-Idling Law for trucks and non-emergency cars	266	Community	X		
	27	Municipal	X		
Compressed Natural Gas (CNG) Vehicles	184	Community		X	
	6	Municipal		X	
Increase School Bus Ridership	181	Community	X		
Initiate a Carshare	172	Community	X		
Electric Vehicles	169	Community		X	
	16	Municipal		X	
Increase Rail Transit Ridership	132	Community		X	X
	17	Municipal	X		
Limit Idling of Local Transit Buses and School Buses	127	Community	X		
Increase Bus Ridership + Regional Transportation Study to Determine Communting Patterns	69	Community		X	
Electric Vehicle Charging Stations on Parking Structures and Other Locations	50	Community		X	
Provide Bicycles for Daily Trips	38	Community		X	
Police on Bicycles	21	Municipal	X		

Safe Routes to School	55	Community	X		
Retrofit School Buses with Oxydation Catalysts	n/a	Community	X		
School Bus Emissions Controls--Particulate Trap	n/a	Community	X		

Waste + Recycling

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Green Business Programs	2,816	Community	X		
Establish/Expand Curbside Recycling Programs. Increase Plastic Recycling Eligability	14,499	Community		X	
Implement Pay-as-You-Throw Program	8,263	Community		X	
Reuse Facilities/Programs	6,652	Community	X		
Establish/Expand Business Recycling Programs	3,156	Community	X		
Organics Composting	4,052	Community	X		

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Yard Waste Composting	1,153	Community	X		
Reuse or Recycling of Construction Materials	n/a	Community		X	
Community Waste Study Holistic Waste Education/ Back Yard Composting	n/a	Community	X		
Zero Waste Goal for Public Events	n/a	Community	X		
	n/a	Municipal	X		
Plastic & Paper Bag Fee/ Reusable Bag Distribution Program	n/a	Community	X		
#6 Plastic Ban	n/a	Community		X	
Tap Water Campaign	n/a	Community	X		
Bedford Waste Carting Study with Evaluation of Permitting and Reporting Requirements	n/a	Community	X		
Recyclable Procurement Policy Requiring Purchase of Recyclable Materials	n/a	Municipal	X		
Low-VOC Procurement Policy for Cleaning Products and Paint	n/a	Municipal	X		

Land + Water Use

Measure	tonnes $C0_2e$ reduced	who will implement	timeframe S	M	L
Water Conservation	1229	Community	X		
	2	Municipal	X		
Build Water Capacity through Municipal Codes and Regulations	n/a	Community	X		
Modified Town Water Billing System	n/a	Community	X		
Transit Oriented Development	588	Community		X	X
Increase Urban Forest	126	Community	X	X	
Plant Trees to Shade Buildings	38	Community	X	X	
	2	Municipal	X	X	
Low-Maintenance Landscaping	326	Community	X		
	2	Municipal	X		
Gasoline Lawnmower Replacement	n/a	Community		X	
Non-Asphalt Pavements	n/a	Community	X		
	n/a	Municipal	X		

V. Glossary

Anthropogenic: Caused or produced by humans

B-20 Biodiesel: A blend of 20% biodiesel and 80% petroleum diesel

BEAP: The Bedford Energy Advisory Panel

CAP: Climate Action Plan

Cap and Trade: A policy that mandates cap on emissions while providing an ability to trade allowances. Successful cap and trade programs reward innovation, efficiency, and early action and provide strict environmental accountability without inhibiting economic growth.

CFL: Compact Fluorescent Light Bulbs

CH_4: Methane, a powerful greenhouse gas

CNG: Compressed Natural Gas

CO: Carbon Monoxide

CO_2: Carbon Dioxide

CO_2e: Carbon dioxide equivalent units converting all emissions to equivalent carbon dioxide units allows for the consideration of different greenhouse gases on comparable terms

Energy Star: ENERGY STAR is a partnership between the U.S. Environmental Protection Agency and industry to voluntarily label products that meet certain energy efficiency criteria

EPA: Environmental Protection Agency

Feedback Loops: A pattern of interacting processes where a change in one variable, through interaction with other variables in the system, either reinforces the original process (positive feedback) or suppresses the process (negative feedback).

GPM: Gallons per minute

Greenhouse Gas (GHG): the term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide

HERs: Acronym for Home Energy Rating

HVAC: Acronym for Heating, Ventilating, and Air Conditioning

ICLEI: The International Council for Local Environmental Initiatives, a membership association of local governments focused on addressing the climate challenge

IPCC: Intergovernmental Panel on Climate Change

kW: A kilowatt, equal to 1,000 watts

kWh: A kilowatt hour (1,000 watt-hours), the work performed by one kilowatt of electric power in one hour

Kyoto Protocol: The United Nations Treaty that targets the reduction of greenhouse gas emissions

LED: Light emitting diode

LEED: Leadership in Energy and Environmental Design, a commonly used green building standard developed by the U.S. Green Building Council

Life Cycle Assessment: The investigation and valuation of the environmental impacts of a given product or service caused or necessitated by its existence

Metric ton: 1,000 kilograms (or 2204.6226 lbs.). Also known as a tonne.

MMBtu: Million British Thermal Units, unit of energy equivalent to 10 therms.

MPG: Miles Per Gallon

NOx: Nitrogen Oxides

NYSERDA: New York State Energy Research and Development Authority

PM10: Course Particulate Matter

PV: Photovoltaics, a solar power technology that converts sunlight into electricity

Renewable Energy (RE): Energy generated from natural resources - such as sunlight, wind, rain, tides and geothermal heat - which are naturally replenished.

Solar thermal: A technology that captures solar energy for heat

SOx: Sulfur Oxides

Sustainable Bedford Coalition (SBC): Community-wide entity stateholders formed to implement the measures conatined in the Bedford CAP.

Therm: 100,000 British Thermal Units (BTUs), equivalent to approximately 100 standard cubic feet of natural gas

T/CO_2e: Metric Tonnes of CO2 equivalent

VMT: Vehicle miles traveled

VOCs: Volatile Organic Compounds

Weatherization: The reduction of air infiltration by methods such as caulking and weather stripping

Xeriscaping: Landscape with little need for water

Zero Waste: The City's goal to eliminate waste sent to the landfill by 2020. All of the community s discarded material would be recycled or reused

VI. Acknowledgements

The Bedford Climate Action Plan was designed and prepared by Jesse Catalano, A Middlebury College student, whose participation in this project was made possible by The Bedford Garden Club and the Open Space Institute s Barnabus McHenry Grant. The members of the Bedford Energy Advisory Panel provided direction, data and review of this plan.

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Bedford Twenty by 2020 logo designed by Carol Bouyoucous

Overall layout, photos, charts and graphs designed by Jesse Catalano

ICLEI - Local Governments for Sustainability

Missy Stults, Senior Program Officer, Northeast Regional Capacity Center

VII. Sources

We d like to thank Westchester County, NY and the cities of Berkely CA, Worcester MA, Portland OR, Chicago, IL, Cambridge MA whose Climate Action Plans inspired us.

I. Introduction (p. 8-14)

a. Climate Science

- The Intergovernmental Panel on Climate Change, Third Assessment Report “Climate Change 2001: The Scientific Basis”
- Environmental Protection Agency (EPA)

c. Our Climate Action Plan (Quality of Life & Health)

- Cambridge, MA Climate Action Plan
- Westchester County, NY Climate Action Plan
- Environmental Protection Agency (EPA)

c. Our Climate Action Plan (Energy Security)

- House Committee on Energy Independence & Global Warming

c. Our Climate Action Plan (Climate)

- NECIA Report: Confronting Climate Change in the U.S. Northeast 2007
- The Intergovernmental Panel on Climate Change, Third Assessment Report “Climate Change 2001: The Scientific Basis”
- The Intergovernmental Panel on Climate Change, Fourth Assessment Report Climate Change 2007
- Westchester County, NY Climate Action Plan

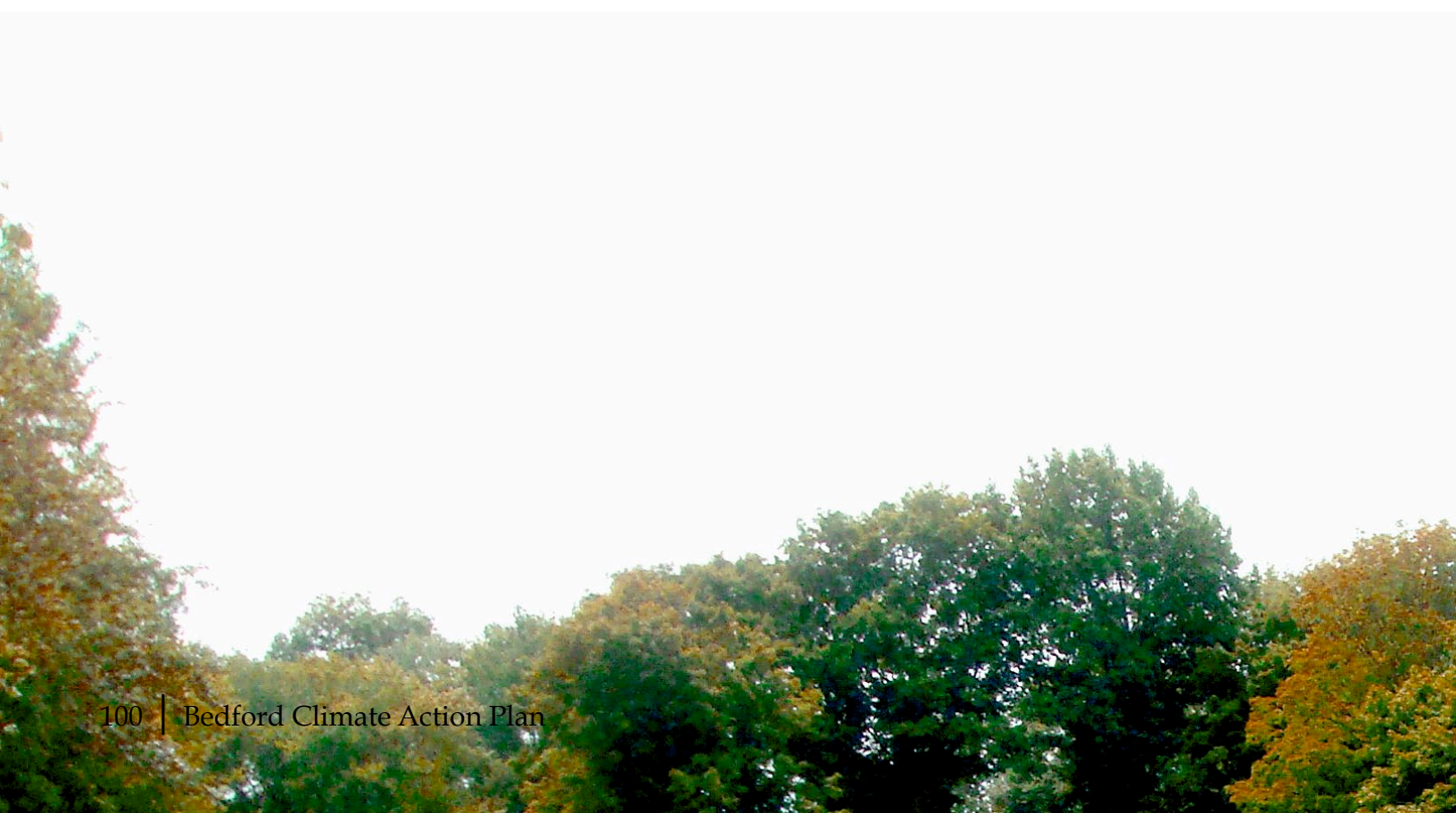
II. Greenhouse Gas Emissions Inventory (p. 18-21)

- Town of Bedford, New York Greenhouse Gas Emissions Analysis, prepared by the Bedford Energy Advisory Panel with assistance for ICLEI, Local Governments for Sustainability

III. Reduction Measures (p. 22-84)

- The Climate and Air Pollution Planning Assistant (CAPPA), developed by ICLEI, Local Governments for Sustainability and sponsored by the Environmental Protection Agency

VIII. Appendix



RESOLUTION

RESOLVED that the Town Board of the Town of Bedford does hereby make a commitment to reduce the greenhouse gas emissions from the 2004 baseline in the Town by 20% by the year 2020 and shall continue to take measures such as the procurement of hybrid vehicles, open space and the construction of bike paths to work towards this commitment level in order to better the environment for the residents of the Town of Bedford and the global community.

STATE OF NEW YORK
COUNTY OF WESTCHESTER } SS.
TOWN OF BEDFORD

I hereby certify that I have compared the foregoing Resolution with the original on file in my office, and that the same is a correct transcriptherefrom and the whole of the said original Resolution, which was duly adopted by the Town Board of the Town of Bedford, on November 20, 2007

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Corporate Seal of said Town of Bedford.

Dated: November 21, 2007

Lisbeth Tumagelli *Town Clerk, Town of Bedford*

Town of Bedford, New York
Greenhouse Gas Emissions Analysis

2004 Community Emissions Inventory
&
2004 Government Operations Emissions Inventory

March 12, 2009
Updated on 6/8/09 to reflect change in fuel oil data

Credits and Acknowledgements

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Kevin Winn, Commissioner, Department of Public Works

Bedford Twenty by 2020 logo designed by Carol Bonyuscous

ICLEI – Local Governments for Sustainability

Misty Stults, Senior Program Officer, Northeast Regional Capacity Center

This report was prepared with assistance from ICLEI – Local Governments for Sustainability. The authors gratefully acknowledge the dedication of the staff of the town of Bedford, who provided much of the insight and local knowledge necessary for the completion of this report.

Table of Contents

1 Introduction

In April 2007, The Town of Bedford joined ICLEI; the Town Board adopted a resolution committing the Town to taking action for climate protection. Through this resolution, the Town recognized the "profound effect" that greenhouse gases emitted by human activity are having on the Earth's climate, as well as the Town's opportunity to reduce these emissions, both through its government operations and by inspiring change throughout the community. Through energy efficiency in its facilities and vehicle fleet, alternative clean energy sources, waste reduction efforts, land use and transit planning, and other activities, the Town of Bedford can achieve multiple benefits, including saving energy and money, reducing emissions, and preserving quality of life in our community. With the assistance of ICLEI – Local Governments for Sustainability, the Town has begun its efforts to identify and reduce greenhouse gas emissions.

This document represents completion of the first milestone in ICLEI's five milestone process: conducting an inventory of greenhouse gas emissions. Presented here are estimates of greenhouse gas emissions resulting from our community as a whole, as well as those resulting from the Town's internal government operations. Due to data availability, community data and government operations data is based on the year 2004. This data will provide a baseline against which we will be able to compare future performance, enabling us to demonstrate progress in reducing emissions.

1.1 Climate Change Background

A balance of naturally occurring gases dispersed in the atmosphere determines the Earth's climate by trapping solar heat. This phenomenon is known as the greenhouse effect. Modern human activity, most notably the burning of fossil fuels for transportation and electricity generation, introduces large amounts of carbon dioxide and other gases into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface temperature to rise, which is in turn expected to affect global climate patterns.

Overwhelming evidence suggests that human activities are increasing the concentration of greenhouse gases in the atmosphere, causing a rise in global average surface temperature and consequent climate change. In response to the threat of climate change, communities worldwide are voluntarily reducing greenhouse gas emissions. The Kyoto Protocol, an international effort to coordinate mandated reductions, went into effect in February 2005 with 161 countries participating. The United States is one of three industrialized countries that chose not to sign the Protocol.

In the face of federal inaction, many communities in the United States are taking responsibility for addressing climate change at the local level. Westchester County and the Town of Bedford are likely to be impacted by changes to local and regional weather patterns and species migration. Scientists also expect changing temperatures to result in more frequent and damaging storms accompanied by flooding and land slides, summer water shortages as a result of reduced snow pack, and disruption of ecosystems, habitats and agricultural activities.

1.2 The Communities for Climate Protection Campaign

By adopting a resolution committing the Town to locally advancing climate protection, The Town of Bedford has joined an international movement of local governments. More than 1000 local governments, including over 500 in the United States, have joined ICLEI's Cities for Climate Protection (CCP) campaign.[1] In addition to The Town of Bedford the neighboring towns of Cortland, Croton-on-Hudson, Dobbs Ferry, Greenburgh, Hastings-on-Hudson, Larchmont, Mamaroneck, Mt. Kisco, New Castle, New Rochelle, North Castle, Ossining, Tarrytown, Yonkers, Yorktown and Westchester County are all CCP participants.

The CCP campaign provides a framework for local communities to identify and reduce greenhouse gas emissions, organized along five milestones:

(1) Conduct an inventory of local greenhouse gas emissions;

(2) Establish a greenhouse gas emissions reduction target;

(3) Develop an action plan for achieving the emissions reduction target;

(4) Implement the action plan; and,

(5) Monitor and report on progress.

This report represents the completion of the first CCP milestone, and provides a foundation for future work to reduce greenhouse gas emissions in The Town of Bedford.

2 Greenhouse Gas Emissions Inventory

The first step toward reducing greenhouse gas emissions is to identify baseline levels and sources of emissions in The Town of Bedford, as well as the sectors of our community and government operations that are responsible for the bulk of these emissions. This information can later inform the selection of a reduction target and possible reduction measures.

2.1 Methodology and Model

ICLEI's Communities for Climate Protection methodology assists local governments to systematically track energy and waste related activities in the community, and to calculate the relative quantities of greenhouse gases produced by each activity and sector. The inventory methodology involves performing two assessments: a communitywide assessment and a separate inventory of government facilities and activities. The government inventory is a subset of the community inventory.

Once completed, these inventories provide the basis for the creation of an emissions forecast, and allow for the quantification of emissions reductions associated with proposed measures.

[1] ICLEI was formerly known as the International Council for Local Environmental Initiatives, but the name has been changed to ICLEI – Local Governments for Sustainability.

2.1.1 CACP Software

To facilitate community efforts to reduce greenhouse gas emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package with the State and Territorial Air Pollution Program Administrators (STAPPA), the Association of Local Air Pollution Control Officials (ALAPCO), and Torrie Smith Associates. This software calculates emissions resulting from energy consumption and waste generation. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Greenhouse gas emissions are aggregated and reported in terms of equivalent carbon dioxide units, or CO2e. Converting all emissions to equivalent carbon dioxide units allows for the consideration of different greenhouse gases in comparable terms. For example, methane is twenty-one times more powerful than carbon dioxide on a per molecule basis in its capacity to trap heat, so the CACP software converts one ton of methane emissions to 21 tons of carbon dioxide equivalents. The CACP software is also capable of reporting input and output data in several formats, including detailed, aggregate, source-based and time-series reports.

The emissions coefficients and methodology employed by the CACP software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form1605).

The CACP software has been and continues to be used by over 500 U.S. cities, towns, and counties to reduce their greenhouse gas emissions. However, it is worth noting that, although the software provides The Town of Bedford with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. The model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. With this in mind, it is useful to think of any specific number generated by the model as an approximation of reality, rather than an exact value.

2.2.2 Creating the Inventory

Our greenhouse gas emissions inventory consists of two essentially distinct inventories: one for the Town of Bedford community as a whole, defined by our geographic borders, and one highlighting emissions resulting from the Town of Bedford's internal government operations. The government inventory is a subset of the community-scale inventory (the two are not mutually exclusive). This allows the government, which formally committed to reducing emissions, to track its individual facilities and vehicles and to evaluate the effectiveness of its emissions reduction efforts at a more detailed level. At the same time, the community-scale analysis provides a performance baseline against which we can demonstrate progress being made throughout the Town of Bedford community.

Creating our emissions inventory required the collection of information from a variety of sources (See Appendix 1 for inventory source data.) Data from the year 2004 was used for both the community inventory and the government inventory.

When calculating the Town of Bedford's emissions inventory, all energy consumed in the Town of Bedford was included. This means that, even though the electricity used by Town of Bedford residents is produced elsewhere, this energy and the emissions associated with it appears in the Town of Bedford's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full responsibility for the impacts associated with its energy consumption, regardless of whether or not the energy generation occurs within its geographic borders.

2.2 Inventory Results

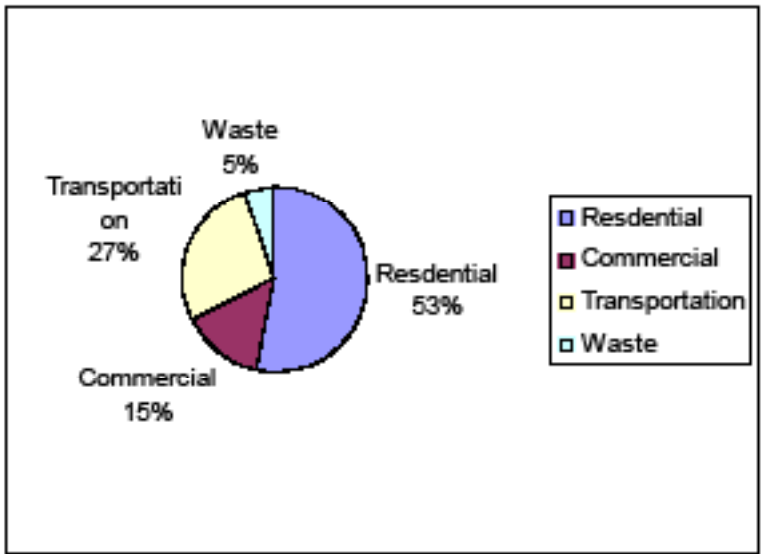
2.2.1 Community Emissions Inventory

In the base year 2004, the community of The Town of Bedford emitted approximately 275,951 tonnes of CO2e. As shown in Table 1, and illustrated in the pie chart below, Residential use was the greatest contributor to greenhouse gas emissions at 53% of the total. The Commercial sector contributed 15%, Transportation contributed 27%, and Waste contributed 5% of the community's total greenhouse gas output.

Table 1: The Town of Bedford Community-Wide Greenhouse Gas Emissions in 2004

Sector	Greenhouse Gas Emissions (tonnes CO2e)	Energy Equivalent (MMBtu)
Residential	146,451	1,806,823
Commercial	40,118	400,452
Transportation	74,693	959,118
Waste	14,691	
Total	275,951	3,166,393

Figure 1. The Town of Bedford Community-Wide Greenhouse Gas Emissions in 2004



The Town of Bedford community's consumption of electricity and other fuels in local buildings and vehicles is also responsible for the release of criteria air pollutants, including NO_X, SO_X, CO, VOCs, and PM_{10}. The Transportation sector is responsible for the majority of NO_X, CO and VOC emissions, while energy used in buildings is primarily responsible for emissions of SO_X and PM_{10}.

Table 2. The Town of Bedford Community-Wide Criteria Air Pollutant Emissions in 2004

Sector	NO_X (lbs)	SO_X (lbs)	CO (lbs)	VOCs (lbs)	PM_{10} (lbs)
Residential	472,950	502,916	79	24,440	126,786
Commercial	110,210	305,689	37	9,758	68,026
Transportation	580,583	30,162	1,966	455,526	17,166
Total	1,163,743	838,766	2,082	489,722	211,977

2.2.2 Government Emissions Inventory

In the base year 2004, The Town of Bedford's government operations generated 5,360 tonnes of CO2e. The Town's buildings were the greatest contributors, emitting 74% of the total. The vehicle fleet contributed 20%, streetlights contributed 5%, and waste contributed 1% of the government emissions.

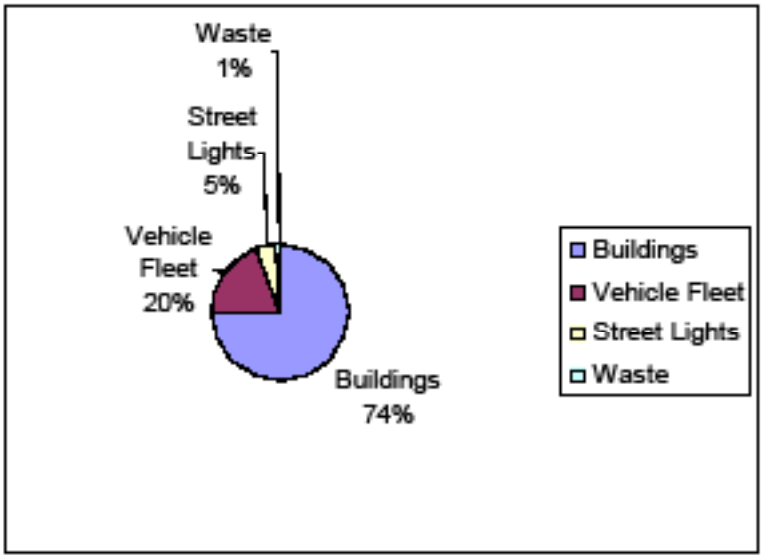
During 2004, the Town of Bedford government spent approximately $552,923 on energy-related expenses for its buildings, streetlights and vehicles. Beyond reducing harmful greenhouse gases, any future reductions in government operations' energy use have the potential to reduce this expense, enabling the Town of Bedford to reallocate limited funds toward other deserving causes. Table 3 and Figure 2 below illustrate the breakdown of government operations emissions by

source type. (See Appendix 2 for a detailed listing of government operations energy consumption and greenhouse gas emissions by activity.)

Table 3: The Town of Bedford Government Operations Emissions Summary

Sector	Greenhouse Gas Emissions (tonnes CO2e)	Energy Equivalent (million Btu)	Cost ($)
Buildings	4,000	64,611	229,415
Vehicle Fleet	1,058	13,468	148,436
Streetlights	251	2,118	98,309
Waste	53		78,873
TOTAL	5,360	80,194	552,923

Figure 2. Government Operations Greenhouse Gas Emissions in 2004



Government operations emissions in The Town of Bedford constitute about 2.6 percent of the community's total greenhouse gas emissions. This is not unusual; local government emissions typically account for around two percent of community levels. As a minor contributor to total emissions, actions to reduce government operations energy use will have a limited impact on The Town of Bedford community's overall emissions levels. However, as previously mentioned, government action has symbolic value that extends beyond the magnitude of emissions actually reduced.

Table 4. **The Town of Bedford** Building Energy Use Greenhouse Gas Emissions in 2004[2]

Site	Light fuel Oil Use (US Gal)	Light fuel Oil Cost($)	Electricity Use (kWh)	Electricity Cost ($)	Natural Gas Use (therms)	Natural Gas Cost ($)	Energy Equivalent (MMBtu)	Greenhouse Gas Emissions (tonnes CO2e)
21 Park Ave	1,838	2,312			3,078	3,415	3,397	195
301 Adams	8,841	8,484	55,589	7,784			1,147	94
425 Cherry St			107,340	12,984	2,400	2,735	2,815	181
87 Adams	162	168					1	0
Annex 307, 309 Bedford Rd			26,563	3,329			91	11
BH Community House	4,308	5,525	18,263	3,189	3,402	1,042	4,136	247
Cedar Downs Pump house					34,072	6,061	34,757	1,948
Crusher Rd Garage	2,753	3,300					385	29
Depot Plaza			2,400	488	1,135	1,368	1,166	66
Guard Hill Tower					3,648	838	3,721	209
Haines Rd Soccer Fld			5,540	2,517			19	2
Charles Rd – Hwy					742	298	757	42
Rt 22 – Hwy Garage			16,384	2,281			56	7
Police Station	3,707	4,881	182,340	19,153			1,141	113
Rec – pools/filters/ bathhouse/concession	510 (propane)	704	236,821	28,137			856	99
Tenant Space			9,983	1,380			34	4
321 Bedford Road			183,520	22,087	7,020	7,844	7,788	476
Water Pumps/ Facilities/Tanks			687,108	77,333			2,345	278
Buildings Total	20,120	25,354	1,531,855	180,662	55,497	23,399	64,611	4080

Town of Bedford Emissions Inventory, March 2009 7

Table 5. The Town of Bedford Street and Traffic Lighting Greenhouse Gas Emissions in 2004

Site	Electricity Use (kWh)	Electricity Cost ($)	Energy Equivalent (MMBtu)	Greenhouse Gas Emissions (tonnes CO2e)
Traffic Signals	37,945	5,690	130	15
Parking Lots	72,546	11,300	248	29
Flashing Light – Rt 172	1,412	215	5	1
Kat.Bed/BH	472,384	73,328	1,612	191
B.H. Street Lighting	36,162	5,568	123	15
Street & Traffic Total	620,449	96,399	2,118	251

Table 6. The Town of Bedford Vehicle Fleet Greenhouse Gas Emissions in 2004

Department	Gasoline Consumption (gal)	Diesel Consumption (gal)	Total Fuel Cost ($)	Energy Equivalent (MMBtu)	Greenhouse Gas Emissio (tonnes CO2
Police pump	40,584		57,306	5,095	3
Highway Pump	9,145	58,943	91,130	8,371	6
Vehicle Fleet Total	49,709	58,943	148,436	13,466	1,0

The Town of Bedford was also responsible for the release of criteria air pollution in 2004, as shown below. These pollutants have been linked with various environmental and public health outcomes and many of the actions we might take to reduce greenhouse gas emissions will also have a positive impact in reducing these pollutants as well.

Table 7. The Town of Bedford Government Operations Criteria Air Pollutant Emissions in 2004

Sector	NO_x (lbs)	SO_x (lbs)	CO (tonnes)	VOCs (lbs)	PM_{10} (lbs)
Buildings	11,542	6,653	2	765	1,854
Streetlights	527	1,630		88	517
Vehicle Fleet	5,534	185	16	4,337	398
Total	17,604	8,467	18	5,190	2,568

3 Conclusion

In passing a resolution to join the Communities for Climate Protection campaign, The Town of Bedford made a formal commitment to reduce its emissions of greenhouse gases. This report lays the groundwork for those efforts by estimating baseline emissions levels against which future progress can be demonstrated.

This analysis found that The Town of Bedford community as a whole was responsible for emitting 275,951 tonnes of CO_2e in the base year 2004, with the residential sector contributing 53 percent, the commercial sector contributing 15 percent, the transportation sector contributing 27 percent and the waste sector contributing 5 percent to this total. The Town of Bedford's government operations were responsible for 5,360 tonnes in 2004. The Town of Bedford's government operations account for roughly 2 percent of the community's total greenhouse gas emissions.

Following the ICLEI methodology, we recommend that The Town of Bedford's next forecast anticipated future emissions and engage in consideration of potential greenhouse gas reduction targets for both the community as a whole, and internal government operations. The Town should also begin to document emissions reduction measures that have already been implemented since the base years documented in this report, and to quantify the emissions benefits of these measures to demonstrate progress made to date.

Next, the Town should begin to identify potential new emissions reduction measures that might be implemented in the future, including energy efficiency, clean energy, vehicle fuel efficiency or alternative fuel use, trip reduction strategies, waste reduction, and other projects. We feel confident that a number of opportunities exist for the Town to reduce emissions while saving taxpayer dollars, improving efficiency and reducing waste.

The Town of Bedford's Energy Advisory Panel will advise and support the Town Supervisor and Town Board in continuing the climate protection efforts of The Town of Bedford. The Panel is eager to aid the Town in its demonstrated leadership on this important issue.

Appendix 1 Data Sources

Community-Wide Emissions Inventory Source Data for 2004

Community-Wide Aggregate Utility Data

	Electricity (kWh)	Natural Gas (therms)	Light Fuel Oil (US Gal)	Energy Equivalent (MMBtu)
Residential	93,424,722	2,284,570	8,989,250	1,806,823
Commercial	45,455,743	790,520	589,620	313,914
Subtotal	138,880,465	3,075,090	9,568,870	2,120,737

Data provided: NYSEG and Con Edison data 2004

Community-Wide Transportation Data

	Vehicle Miles Traveled (millions)	Energy Equivalent (MMBtu)
Subtotal	124.3	958,118

Transportation data from: New York Metropolitan Transportation Council – Michael Chimne (Senior Transportation Analyst)

Community-Wide Waste Data

	Amount of Waste Landfilled (tons)	Waste Composition (%)	Equivalent CO2 (tonnes)
Community Waste	15,239	100	14,691
Paper Products	5,791	38	
Food Waste	1,981	13	
Plant Debris	1,524	10	
Wood/Textiles	610	4	
All Other Waste	5,334	35	
Total Waste Landfilled	15,239	100	14,691

Waste data from: Assumptions based on EAP data on waste generation per person/day

Government Operations Emissions Inventory Source Data for 2004

The Town of Bedford Building Energy Use

	Light Fuel Oil (US Gal)	Light Fuel Oil Cost ($)	Electricity Use (kWh)	Electricity Cost ($)	Natural Gas Use (therms)	Natural Gas Cost ($)
Buildings Total	20,120	25,354	1,531,855	180,662	55,497	23,399

Data provided: All municipal data was obtained from 2004 invoices (Feb 2004-Jan 2005) filed in the "paid prior" files in the basement of the Town House, 321 Bedford Road

The Town of Bedford Street and Traffic Lighting

Site	Electricity Use (KWH)	Electricity Cost ($)
Traffic Signals	37,945	5,890
Parking Lots	72,564	11,300
FlashLight – Rt 172	1,412	215
Kat.Bed/BH	472,384	73,328
B.H. Street Lighting	36,162	5,568
Street/Traffic Total	620,467	96,399

Data provided by: All municipal data was obtained from 2004 invoices (Feb 2004-Jan 2005) filed in the "paid prior" files in the basement of the Town House, 321 Bedford Road

The Town of Bedford Vehicle Fleet

Department	Gasoline Consumption (gal)	Diesel Consumption (gal)	Total Fuel Cost ($)
Police Pump	40,564		57,306
Highway Pump	9145	58943	91,130
Subtotal Vehicle Fleet	49,709	58,943	148,436

Data provided by: All municipal data was obtained from 2004 invoices (Feb 2004-Jan 2005) filed in the "paid prior" files in the basement of the Town House, 321 Bedford Road

Appendix 2 Inventory Reports

Community Emissions in 2004: Detailed Report

	Equiv CO_2	Equiv CO_2	Energy Equivalent
	(tonnes)	(%)	(MMBtu)
Residential			
Town of Bedford Aggregate Residential Energy Use			
Electricity	39,193	14.2	318,858
Light Fuel Oil	94,453	34.2	384,498
Natural Gas	12,805	4.6	228,457
Subtotal Residential	146,451	53.1	911,811
Commercial			
Town of Bedford Aggregate Commercial Energy Use			
Electricity	19,068	10.8	155,139
Industrial Electricity	812	D.	4,980
Municipal Electricity	10,025	D.	81,558
Light Fuel Oil	5,979	2.2	79,722
Natural Gas	4,431	1.6	79,052
Subtotal Commercial	40,116	14.5	400,452
Transportation			
Town of Bedford Community VMT Estimate			
Gasoline	61,960	22.4	796,135
Diesel	12,833	4.7	162,983
Subtotal Transportation	74,893	27.1	959,118
Waste			
Land filled Community Waste			
Paper Products	11,233	4.1	
Food Waste	2,175	0.8	
Plant Debris	948	0.3	
Wood/Textiles	335	0.1	
Subtotal Land filled Community Waste	14,691	5.3	
Total	275,951	100.0	3,166,393

This report has been generated for The Town of Bedford, New York using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy Equivalent (MMBtu)
Buildings			
Fuel Oil	204	3.8	2,722
Electricity	820	11.6	5,229
Natural Gas/Propane	3178	59.3	56,680
Subtotal Buildings	**4,080**	**74.6**	**64,611**
Vehicle Fleet			
Highway Pump			
Gasoline	88	1.7	1,150
Diesel	571	10.6	7,213
Subtotal DPW	660	12.3	8,371
Police			
Gasoline	395	7.4	5,095
Subtotal Police	395	7.4	5,095
Subtotal Vehicle Fleet	**1,055**	**19.7**	**13,466**
Streetlights			
Traffic Signals			
Electricity	15	.3	130
Subtotal Traffic Signals	15	.3	130
Parking Lots			
Electricity	28	.5	248
Subtotal Parking Lots	28	.5	248
Flashing Light-Rt 172			
Electricity	1	0	5
Subtotal Flashing Light	1	0	5
Kat/Bed/BH			
Electricity	191	3.6	1,612
Subtotal Kat/Bed/BH	191	3.6	1,612
BH Street Lighting			
Electricity	15	.3	123
Subtotal BH Street Lighting	15	.3	123
Subtotal Streetlights	**251**	**4.7**	**2,118**
Waste	**53**	**1.0**	
Subtotal Waste	**53**	**1.0**	
Total	**5,360**	**100.0**	**80,194**

This report has been generated by The Town of Bedford, New York using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Tonnie Smith Associates Inc.

Town of Bedford

Bedford Town House
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Bedford Hills, NY 10507